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United States Department of the Interior
Bureau of Land Management
Butte District

State of Montana
Department of Environmental Quality

April 1998

Final
Environmental Impact Statement Amending and Adopting the Draft Environmental Impact Statement - Golden Sunlight Mine

COOPERATING AGENCIES:

Montana Department of Natural Resources and Conservation
U.S. Army Corps of Engineers

98-034704

C

BLM MISSION STATEMENT

The Bureau of Land Management is responsible for the stewardship of our public lands. It is committed to manage, protect, and improve these lands in a manner to serve the needs of the American people for all times.

Management is based upon the principles of multiple use and sustained yield of our nation's resources within a framework of environmental responsibility and scientific technology. These resources include recreation, rangelands, timber, minerals, watershed, fish and wildlife, wilderness, air and scenic, scientific, and cultural values.

BLM/MT/PL-98/010+1990

I

State of Montana
Department of Environmental Quality
PO Box 200901
Helena MT 59620-0901

U.S. Department of the Interior
Bureau of Land Management
Headwaters Resource Area
PO Box 3388
Butte MT 59702

April 1998

Dear Reader:

Enclosed is the Final Environmental Impact Statement (EIS) for the Golden Sunlight Mine adopting the Draft EIS as a part of the final, responding to public comments, and providing substantive changes which amend the Draft EIS in response to public comments. Thus, the Draft EIS, as amended by this Final EIS, is adopted as part of the complete Final EIS.

About 250 copies of the Draft EIS were distributed to the public and other federal and state agencies in November 1997 for a 60-day comment period. During the comment period, the Montana Department of Environmental Quality (MDEQ) and the Bureau of Land Management (BLM) held a public hearing in Whitehall to receive oral and written comments on the Draft EIS. The U.S. Army Corps of Engineers (COE) also took comments on Golden Sunlight's Section 404 application under the Clean Water Act. In addition to oral testimony, the agencies received 289 letters commenting on the Draft EIS. All comments were reviewed and considered in preparing the Final EIS. Comments that provided new data, questioned facts or analysis, or raised questions or issues bearing directly on the alternatives or environmental analysis have been given responses in this Final EIS. Comments expressing personal opinions were considered but have drawn no direct response.

MDEQ and BLM have selected the Proposed Action as modified by the Return Diversion and No Pit Pond alternatives as the preferred alternative. The final decision will be made in the Record of Decision that will be prepared no sooner than 30 days after the Notice of Availability of the Final EIS is published in the Federal Register.

The agencies appreciate the public's involvement in preparing this Final EIS. Additional copies are available upon request from MDEQ. A copy of the Record of Decision will be sent to everyone who receives the Final EIS.

Mark A. Simonich

Mark A. Simonich, Director
State of Montana
Department of Environmental Quality

Merle Good

Merle Good, Area Manager
Bureau of Land Management
Headwaters Resource Area

Final Environmental Impact Statement
Amending and Adopting the Draft Environmental Impact Statement

Golden Sunlight Mine Expansion
Jefferson County, Montana

April 1998

Lead Agencies: State of Montana, Department of Environmental Quality and United States Department of the Interior, Bureau of Land Management, Headwaters Resource Area.

Cooperating Agencies: United States Army Corps of Engineers and State of Montana, Department of Natural Resources and Conservation.

Contacts for Further Information: Greg Hallsten, Montana, Department of Environmental Quality, P.O. Box 200901, Helena, MT 59620-0901, (406-444-3276); and David Williams, Bureau of Land Management, P.O. Box 3388, Butte, MT 59702 (406-494-5059).

Abstract: This abbreviated Final EIS adopts the Draft EIS, with amendments, as part of the Final EIS. The complete Final EIS consists of this document and the Draft EIS, issued in November 1997. The Final EIS analyzes impacts associated with the implementation of Amendment 008 and the extension of mine life through 2006 of the Golden Sunlight Mine near Whitehall, Montana. The Final EIS analyzes seven alternatives, including the No Action Alternative and the company's Proposed Action. Significant issues include: acid rock drainage, groundwater and surface water quality, waste rock dump slope angle and dump reclamation success, pit reclamation, and perpetual water treatment. The preferred alternative at this time is the Proposed Action as modified by the Return Diversion and No Pit Pond alternatives. This alternative would allow continued mining while reducing or avoiding environmental impacts.

Other Environmental Review: This Final EIS also serves as the environmental review document for a permit decision to be made by the U.S. Army Corps of Engineers under Section 404 of the Clean Water Act. The Montana Department of Natural Resources and Conservation will use information in this review for permitting actions concerning state-owned land and minerals.

Dates: A Record of Decision will be prepared no earlier than 30 days following the date the Environmental Protection Agency publishes the Notice of Receipt for the Final EIS in the Federal Register. A copy of the Record of Decision will be sent to everyone who receives the Final EIS.

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APPENDIX 1 - STATEMENT OF BASIS FOR PROPOSED MIXING ZONE 1-1

I SUMMARY

I.A PURPOSE AND NEED

Golden Sunlight Mines, Inc. (GSM) mines and processes gold-bearing ore on public and private lands near Whitehall, Montana, under Operating Permit No. 00065 administered by the Montana Department of Environmental Quality (MDEQ) and the United States Department of the Interior's Bureau of Land Management (BLM). This Environmental Impact Statement (EIS) addresses a 1994 Montana District Court decision that requires preparation of an EIS to evaluate the environmental effects of implementing Amendment 008 to Operating Permit No. 00065.

On September 1, 1994, a Montana District Court ruled that the Montana Department of State Lands (MDSL) improperly evaluated the potential for significant environmental impacts that could result from the implementation of Amendment 008, and that an EIS must be prepared to further evaluate these impacts. On February 7, 1995, a settlement agreement was reached that allowed mining to continue until the EIS was completed.

On July 1, 1995, MDSL was terminated by legislative action and its mine land reclamation regulatory functions were assumed by the newly created Montana Department of Environmental Quality (MDEQ). The new MDEQ assumed MDSL's responsibility for preparing an EIS for Amendment 008.

In addition to evaluating the potential impacts from implementation of Amendment 008, this EIS also evaluates a 1995 proposal by GSM to further amend its Operating Permit to extend the life of active mining through approximately 2006. This EIS thoroughly investigates the environmental impacts associated with the issues raised by the 1994 District Court decision, as well as the environmental impacts associated with continued mining through 2006. ***Several alternatives to the applicant's Proposed Action for continued mining also were analyzed. These are described in the following section.***

I.B ALTERNATIVES

No Action

Under the No Action Alternative, mining would cease when currently permitted waste rock dump space is filled. No new construction or expansion of the pit, waste rock dumps, process facilities, or tailings impoundments would occur. Current mining operations would cease, and all facilities would be reclaimed using the existing reclamation plan.

Proposed Action

The Proposed Action would allow continued operation of the mine site beyond its current permit boundaries. MDEQ and BLM would approve a new amendment to GSM's existing Operating Permit to allow mining to continue until approximately 2006. The Proposed Action would expand the pit, waste rock dump areas, and buttress area. Sheep Rock Creek would be diverted into a tributary of Conrow Creek to prevent water from contacting acid generating waste rock.

Under the Proposed Action, the mine's permit boundary would expand to include an additional 1,054 acres (631 acres of GSM-owned land, 323 acres of BLM administered land, and 100 acres of state school trust land administered by the Montana Department of Natural Resources and Conservation [MDNRC]). Disturbances associated with mining activities would expand to include an additional 627 acres (517 acres of GSM-owned land, 75 acres of BLM-administered land, and 35 acres of state school trust land). Ore tonnage processed under the Proposed Action would be 55 million tons, as compared to approximately 34.1 million tons processed through completion of currently permitted mining activities.

The reclamation plan under the Proposed Action differs from the current reclamation plan with respect to the size of the surface disturbance requiring reclamation, the capping material required for reclaiming the tailings impoundment, and the reclamation schedule.

Return Diversion Alternative

This alternative is a modification of the Proposed Action that would avoid potential impacts to the Conrow Creek drainage. Under the Proposed Action, a diversion channel would divert flows from Sheep Rock Creek into the Conrow Creek drainage. The increased flows in the Conrow Creek drainage have the potential to cause increased erosion and channel morphology changes in Conrow Creek and one of its tributaries. Under the Return Diversion Alternative, Sheep Rock Creek would be diverted around the East Waste Rock Dump and would reconnect with its natural drainage south of the dump, thereby avoiding the Conrow Creek drainage. Construction of the diversion channel would result in an additional 2.5 acres of disturbance as compared to the Proposed Action.

Divided Dump Alternative

This alternative is a modification of the Proposed Action that would avoid potential impacts to the Conrow Creek drainage and avoid permanent placement of waste rock in the Sheep Rock Creek drainage channel. The Divided Dump Alternative eliminates the need to place waste rock in Sheep Rock Creek by providing alternative options for waste rock disposal. Under this alternative, the East Waste Rock Dump capacity would be reduced by approximately 63 million tons as compared to the Proposed Action. This lost capacity would be recovered by distributing waste rock into several alternative areas. New disturbance areas would vary between a minimum scenario of 407 acres and a maximum scenario of 600 acres, depending on the areas selected for waste rock disposal (approximately 27 to 220 acres less disturbance than under the Proposed Action). There would be no need to divert Sheep Rock Creek into the Conrow Creek drainage to prevent water from contacting acid-generating waste rock because no waste rock would be placed in Sheep Rock Creek.

3:1 Slope Alternative

This alternative addresses concerns raised in the Court Order and Settlement Agreement regarding the feasibility of reclaiming 2:1 waste rock slopes. Under the 3:1 Slope Alternative, additional slopes would be graded to 3:1 (rather than 2:1) prior to revegetation. This alternative could be selected by the agencies as a reclamation option for either the No Action Alternative or the Proposed Action. By reducing slopes to 3:1, the east and west waste rock dumps would be 92 and 22 acres larger, respectively, than under the Proposed Action, resulting in an additional 114 acres of surface disturbance as compared to the Proposed Action.

No Pit Pond Alternative

This alternative addresses potential wildlife impacts that could result from allowing poor quality water to accumulate in the pit. No water would be allowed to pond in the pit bottom under this alternative. Final design at the completion of mining would provide for an underground sump to collect water that enters the pit. Water collected in the sump would be pumped to a permanent water treatment plant as needed. This alternative could be selected by the agencies as a reclamation option for either the No Action Alternative or the Proposed Action.

Partial Backfill Alternative

This alternative addresses concerns raised in the Court Order and Settlement Agreement regarding the feasibility of reclaiming the pit under the Montana Metal Mine Reclamation Act (MMRA). Under the Proposed Action, approximately 19 acres of pit benches would be capped with 24 inches of oxidized waste rock followed by 24 inches of soil and revegetated. Under the Partial Backfill Alternative, approximately 254 acres of the pit would be capped with 24 inches of oxidized waste rock followed by 24 inches of soil and revegetated. All acid-producing rock within the pit would be capped with oxidized waste rock. All other aspects of mine reclamation would be the same as those described for the Proposed Action. This alternative could be selected by the agencies as a reclamation option for either the No Action Alternative or the Proposed Action.

I.C STIPULATION COMPLIANCE

The September 1, 1994, Montana District Court Ruling concluded that it was improper for MDEQ to base its approval of Amendment 008 on mitigation measures that were neither included or evaluated in MDEQ's 1990 Environmental Assessment (EA) for Amendment 008. As required by the February 7, 1995, Settlement Agreement, MDEQ has evaluated in this EIS the effectiveness of the 31 stipulations that were attached to MDEQ's Record of Decision (ROD) for Amendment 008. The substantive provisions contained in the 31 stipulations have been incorporated into GSM's Operating Permit and 1995 Permit Application and are evaluated in this EIS in the analysis of the existing and proposed reclamation plans. Please refer to the complete EIS for more detailed information on the evaluation of the 31 Stipulations. The results of the agencies' evaluation of the 31 stipulations are summarized below.

Stipulation No. 1: All portions of waste rock dumps not needed for vehicular traffic and not proposed for future slope reduction must be reclaimed concurrent with ongoing activities.

Concurrent reclamation is underway in areas that will not be reactivated for future mining or reclamation activity. To date, over *194* acres have been reclaimed. Reclamation, including waste rock dump slope reduction, oxidized waste rock capping, soil placement, and revegetation was initiated in 1995 for portions of the East and South Waste Rock Dumps.

This stipulation has been successful in instituting concurrent reclamation at the Golden Sunlight Mine project area. Concurrent reclamation has been initiated on-site and the commitment to future concurrent reclamation is outlined in both the existing and proposed reclamation plans.

Stipulation No. 2: Research and monitoring plans must be developed, in consultation with the MDEQ and the BLM, in order to determine the effectiveness of the waste rock dump top reclamation described in Stipulation No. 1. The research and monitoring plan must include consideration of parameters that affect oxidation of pyrite and particularly acid drainage from the waste rock dumps. This plan must include and evaluate water balance, taking into consideration the effect of the rock cap and soil layers and the movement of water and oxygen into the reclaimed waste rock dumps. These plans must be submitted for final approval with the Annual Report to be submitted June 27, 1991, hereinafter referred to as the 1991 Annual Report.

Research and monitoring plans to determine the effectiveness of waste rock dump top reclamation have been developed and implemented in consultation with MDEQ and BLM. As originally described in the Annual Report submitted in June 1991, the reclamation test plot program on the high-grade waste rock dump includes a reclaimed dump top test plot. This plot has been evaluated for all of the parameters listed in this stipulation, including infiltration, acidification, and water balance. A description of the test plot and monitoring plan was provided in the Annual Report submitted in March of 1992. A monitoring report is provided in the 1993 and subsequent annual reports.

The test plot studies were designed to provide information related to 2H:1V slope waste rock dump hydrology in light of applied revegetation techniques, as well as grade control factors, capping techniques, and revegetation performance on a variety of slope angles. The capping techniques and waste rock sampling procedures, as well as the oxide cap characteristic criteria proposed as a part of the current reclamation plan, were developed as a result of these studies.

Through 1994, sedimentation rates on the test plots were statistically comparable to natural rates from reference areas, with all rates under a tolerance level of *2.0* tons per acre per year. Similarly, vegetation cover was measured on 2H:1V slopes and found to have exceeded that of reference areas and to have surpassed the vegetation success criteria established for this project. Adjunct modeling using the Revised Universal Soil Loss Equation (RUSLE) as part of the EIS analysis showed that erosion could be held to acceptable levels on slopes up to 2H:1V if soils with the appropriate characteristics are reapplied to the slope surface. Additionally, three separate modeling approaches were used to provide an estimated water balance within the waste rock dumps (HELP; SOILCOVER; and an in-house model by Schafer and Associates, Inc.).

These test plot studies and modeling results predict that 2H:1V slopes can be successfully revegetated using the proposed steep slope reclamation techniques developed for this project (capping, contour benching, dozer gouging, mulching, intensive material sampling, etc.), and that infiltration through the reclaimed waste rock dump surface will be limited to 0.25 to 0.5 inch per year. The oxidation of pyrite is still expected to occur within the waste rock dumps, but the amount of moisture penetrating through the reclamation cap and migrating through the interior of the waste rock dumps is expected to be minimized by the design of the reclamation cap. To avoid long-term impacts to groundwater quality, a long-term groundwater monitoring and treatment plan has been developed and is described in this EIS.

Stipulation No. 3: GSM must construct drainage or seepage control structures in the foundation beneath the waste rock dumps, made of calcareous subsoils and constructed on the contours of the slopes. As-builts must be submitted with the annual reports.

Retention berm construction at the toe of the waste rock dumps has been ongoing since 1990 and continues concurrent with soil stripping. As-builts are submitted with the annual reports. Berms are constructed of *in situ* calcareous subsoils where available. Where possible, they are constructed on contour; however, much of the dump terrain to date has been too steep to allow contour berming. In steep areas, large berms are constructed across the natural drainages. Retention berms have been constructed by dozers and scrapers to a minimal height of six feet.

Retention berms were constructed beneath portions of the West Waste Rock Dump and East Waste Rock Dump in 1996. The berms were constructed in accordance with the plans shown in the Annual Report submitted in March 1992. Plans for as-built construction and planned retention berms are presented in the 1996 Annual Report.

These berms are designed to control seepage by capturing seepage at the toe of the waste rock dumps and promoting the infiltration of seepage into subsoils. With the exception of the pre-existing Midas Spring ***and Sunlight Spring***, no seepage has been documented at the toe of the waste rock dumps to date. The design of these structures should be sufficient to control infiltration through the waste rock dumps that could seep from the toe of the dumps. Any seepage reporting to the berms will contact colluvial materials and flow a very short distance before infiltrating in the colluvium.

Stipulation No. 4: GSM must design and construct an engineered diversion capable of handling a 100-year, 24-hour precipitation event around the tops of the reclaimed waste rock dumps and off the tops of the reclaimed waste rock dumps. Diversion designs must be submitted with the 1991 Annual Report. As-builts must be submitted with the annual report submitted following construction.

The design of the diversion channel system to direct surface storm water runoff around and off of the tops of the reclaimed waste rock dumps was supplied in the Annual Report submitted in March 1992. The design of the diversion channels around the tops of reclaimed dumps and off the tops of reclaimed dumps are adequate to handle a 100-year, 24-hour precipitation event. Implementation of the design will take place during final reclamation of each waste rock dump.

Stipulation No. 5: GSM must evaluate and report the acid-producing potential characteristics of the waste rock dump surface after slope reduction. A sampling density must

be developed from waste rock dump test plots to be initiated in 1990-1991. GSM must layer or incorporate lime amendments (such as limestone), if necessary, on or into the waste rock dump surface, basing the amount needed on the neutralization requirements of the top 6.5 feet of waste rock, and basing the method of layering or incorporation on field testing initiated in 1990-1991.

GSM began testing the acid-producing potential characteristics and lime requirements of the oxidized waste rock cap on test plots in 1991. After reducing the slopes of the waste rock dumps and recontouring the surface, the new waste rock dump surface is tested for potential acid generation by analyzing composite sample taken from a survey controlled 100- X 100-foot grid established on the recontoured surface. The grid is established to verify thickness uniformity of reclamation cover layers. The number of samples tested for acidity is determined by the compositional variability observed in the waste rock dump material. Samples are submitted for either the modified Sobek method of acid-base accounting, or an on-site hydrogen peroxide based NAG pH test. If an on-site NAG pH testing method is used, a minimum number of 1 sample in 50 is verified with the modified Sobek method.

If samples have an acid-base accounting value using the modified Sobek method of >-20 and/or a NAG pH of <3.2, then the upper 6 inches of the dump is limed to neutrality before a 24-inch-thick minimum cap of suitable or limed oxidized waste rock or borrow material is placed on the dump surface. GSM has the option of placing an additional 6 inches of oxidized waste rock or borrow material in the reclamation cap, in lieu of the liming requirement for the upper 6 inches of the acid waste rock dump surface.

Placement of oxidized capping material must meet uniformity criteria established by MDEQ and BLM. After the oxidized cap is in place, the survey grid with 100- X 100-foot spacing is reestablished on the dump, and samples are collected again at each grid intersection. The samples are visually examined, and representative samples are tested. Grid areas with more than one sample having a NAG pH of less than 4.0 are either top-dressed with enough lime to neutralize the cap, or are recapped with suitable oxide rock.

This waste rock dump surface sampling and analysis program appears to offer a reliable means of testing the success of capping efforts and of assessing the acid-producing potential of material within the plant root zone. Media sampling intensity and analysis methods conform to, or exceed, acceptable standards or have been developed specifically to address site conditions. Parameter analysis values selected to indicate that a mitigation action (such as lime amendments) be taken are within acceptable limits. To date, the sampling and analysis methodologies have contributed to an acceptable level of revegetation success at the Golden Sunlight Mine site.

Stipulation No. 6: GSM must evaluate and report the acid-producing potential characteristics and lime requirements of the oxidized waste rock cap during placement. The sampling density, the amounts of lime needed, and the method of incorporation of lime (to neutralize the acid-production potential) must be based on field testing initiated on the oxidized waste rock that is used on the dump test plots in 1990-1991.

GSM's test plots have helped determine the amount of lime needed for oxide capping. GSM also began kinetic testing of cap rock materials with acid-base account values in the 0 to -20 range in 1992 and continued testing in 1993, as described in Appendix AR-93-K of the 1993 Annual Report. A final summary report on all waste rock dump research is provided in Appendix 5.5-1 of GSM's 1995 Permit Application (GSM 1995b).

The sampling and liming plan is provided in GSM's Operating Permit. Samples collected to date are summarized in Appendix AR-96-1.3 of the 1996 Annual Report. The oxidized rock planned for use as capping material is sampled for potential acidity prior to placement according to the procedure described for Stipulation No. 5. If sampled oxidized rock has lime requirements of 0 or more tons lime per 1,000 tons material, it is limed to neutrality.

After the oxidized rock cap is in place, the 100- X 100-foot grid is re-established and samples are collected at each point. The samples are visually examined, and representative samples analyzed for potential acidity. If potentially acidic areas are identified, more samples are submitted. Those grid areas where more than one sample has identified lime rates greater than 0 tons lime per 1,000 tons material will either be top dressed with enough lime to neutralize the cap, or recapped with suitable oxidized rock.

As noted for Stipulation No. 5, the waste rock dump surface sampling and analysis program developed by GSM appears to offer a reliable means of assessing the acid-producing potential of material proposed for use as a rock cap. Rock cap material sampling intensity and analysis methods conform to acceptable standards.

Stipulation No. 7: GSM must sample soil after placement on re-contoured waste rock dumps. The sampling density and parameters to be measured must be determined in consultation with the agencies. The purpose of the sampling is to identify physical or chemical limitations inherent in the soils, which must be minimized, and to identify areas where more extensive erosion control measures may be needed to minimize surface soil loss or mass slippage of soils on slopes.

The cover soil sampling plan was given in Appendix D of the Annual Report submitted in March 1992. After placement, one cover soil sample is collected every five to ten acres. Samples are analyzed for texture, pH, electrical conductivity, sodium adsorption ratio, potential acidity, water holding capacity, and plant nutrients. This data is used to identify whether highly erodible soils are present. Samples collected to date are summarized in Appendix AR-95-1.3 of the 1995 Annual Report.

A density of one soil sample per 5 to 10 acres allows for an adequate evaluation of the characteristics of replaced soils in terms of both physical and chemical characteristics related to the potential for erosion. Assuming this sampling plan is combined with visual erosion inspection monitoring, the plan is considered to be an effective means of identifying where additional erosion control measures may be needed on contoured waste rock dump slopes.

Mitigation Measure 5-1 has been developed to provide for continued monitoring, testing, and restabilization of soils affected by steam venting. Standards and guidelines are provided to identify when stabilization efforts will be required. This measure would be an effective means of assessing and mitigating any soil and vegetation changes occurring as a result of steam venting.

Stipulation No. 8: GSM must design erosion control systems including diversions for the waste rock dump, to be submitted in the 1991 Annual Report, which minimize soil loss off steep, long waste rock dump slopes. GSM must monitor erosion rates to validate the effectiveness of proposed benching or other slope breaks in minimizing total effective slope length.

Erosion control system designs, including storm water runoff diversions for the waste rock dump slopes, were completed in conjunction with designs for storm water runoff diversions around and off the dump tops (see Stipulation No. 4). These designs were described in the Annual Report submitted in March 1992.

An additional cross-section requested by the agencies was included in the Annual Report submitted in March 1993. This cross-section showed the slopes that will be placed on waste rock dump tops to allow water to flow into the diversion structures. The cross-section also showed typical distances between diversion structures on the dump slopes and details of the access roads to service the diversions.

Erosion troughs have been in place below the high-grade waste rock dump reclamation test plots since 1991. Four additional erosion troughs were constructed in the West Waste Rock Dump reclamation test plots in 1994. Summary reports on erosion rates of test plots are provided in Appendices 5.5-1 and 5.5-2 of GSM's 1995 Permit Application (GSM 1995b).

The erosion troughs currently in place indicate that the majority of erosion occurs as sheet erosion. They also have shown that the staggered dozer gouges constructed on the slopes are effective in reducing initial sheet erosion prior to the establishment of vegetation. The calculated erosion rates are significantly less than one ton per acre per year, indicating that sheet erosion should not be a long-term concern.

Stipulation No. 9: Based on GSM's current re-evaluation of waste rock dump design and placement, which is being done in order to 1) minimize ultimate slope reduction, 2) increase benching and other slope length breaks, 3) control runoff from major storm events and 4) relocate soils and oxidized waste rock stockpiles, GSM must submit a revised dumping plan for agency approval in the 1991 Annual Report. The plan must include a revised schedule for decommissioning and concurrent reclamation of the waste rock dumps during mine life.

The revised dumping plan and redesigned dumps were described in the Annual Report submitted in March 1992. The plan focuses on minimizing disturbance and soil erosion. The redesign work also has minimized ultimate slope reduction and increased benching. GSM supplies volumes of oxide rock and soil salvage in GSM's Annual Reports. This information is being provided annually. Current waste rock dump plans can be found in Chapter II of GSM's Operating Permit. Current soil and oxide salvage volumes can be found in the 1996 Annual Report.

The revised waste rock dump plans have accomplished the four goals outlined above and are the basis of the EIS evaluations of waste rock dumps. The revised waste rock dump plans are incorporated into the EIS in the detailed analysis of waste rock dump stability, erosion, infiltration, and reclamation.

Stipulation No. 10: GSM must evaluate methods, for the 1991 Annual Report, of minimizing movement of acidic water to the face of the cycloned sands portion of the embankment face of the reclaimed dike. One of the methods evaluated must be application of a wedge of net-neutralizing material composed of either waste rock or calcareous borrow material to the front face of the cycloned sands portion of the embankment face in order to construct an overall slope of 3H:1V on the embankment face. The material must be 24 inches deep at the crest of the embankment and increase in depth down the embankment face.

GSM evaluated the wedge, and found that it would not further minimize movement of water to the embankment face. In the Annual Report submitted in June 1991, GSM documented that the depositional angle of the cyclone sands is near 3H:1V or flatter. Also, in-place pneumatic piezometer data was presented which indicated that the drains constructed under the impoundment continue to function efficiently over time, and prevent water from seeping out the embankment toe by lowering the phreatic surface in the embankment. When Tailings Impoundment No. 1 is decommissioned, the head behind the embankment will decrease and further reduce the potential for seeps at the embankment toe. Reclamation of the cycloned sand embankment is discussed in Appendix D of the Annual Report submitted in March 1992. The reclamation consists of 2 feet of neutral rock or coarse borrow material for capping, followed by 2 feet of soil, then seeding. Reclamation of the cycloned sand face of Impoundment No. 1 was completed in 1996 and is described in the 1996 Annual Report.

Sand from the Impoundment No. 1 embankment was deposited at 3H:1V or flatter as discussed above, and it is expected that sands on the Impoundment No. 2 embankment will be deposited at a similar angle. If not, slopes will be reduced to 3H:1V.

Stipulation No. 11: GSM must initiate the cycloned sand tailing reclamation test plot, discussed in the application, no later than when impoundment No. 1 is filled to capacity, and must monitor and report the effectiveness of the *reclamation in controlling the oxidation reaction.*

Tailing impoundment test plots were designed and monitored by D. Dollhopf and the Montana State University Land Rehabilitation and Reclamation Department. These plots were heavily monitored to provide data on infiltration and effectiveness of reclamation in limiting seepage, and are fully described in Appendix J of the Annual Report submitted in March 1992. A final report describing the results of this test plot research is provided in Appendix 5.6-1 of GSM's 1995 Permit Application (GSM 1995b). The agencies have concluded that this test plot research has been adequate to evaluate the sand tailings reclamation.

The results of this test plot research concluded that the tailings reclamation cap designs used on the test plots were effective at minimizing infiltration of water into the tailings, and thus, would minimize the amount of seepage from the tailings that would result from direct precipitation. The tailings cap, however, does not exclude oxygen. Therefore, in time, the tailings will acidify, providing a potential for ARD seepage.

Stipulation No. 12: GSM must place 18 inches of low permeability (10^{-7} cm/sec/yr) soils, in two 9-inch compacted lifts, over the entire final tailing surface, carried to the crest of the embankment face. GSM may apply to the agencies for alternative surface reclamation if GSM can document that an alternative would reduce the seepage of acid water to an equivalent degree as the 18-inch soil layer.

On page 34 of the Annual Report submitted in June 1991, GSM indicated that a permeability of 10^{-7} cm/sec was not achievable with most materials. The agencies agreed to revise the permeability requirement for the clay cap to 10^{-6} cm/sec. GSM constructed test plots on the tailings surface in 1992 to evaluate alternative reclamation methods to the clay cap as described in Appendix M of the 1992 Annual Report. The test plots established on the tailings material of Impoundment No. 1 showed that alternate methods of capping were equal to or more effective than a clay cap barrier in terms of preventing acid water seepage and promoting revegetation potentials. See Stipulations No. 13 and No. 18 in this section for further discussion regarding the results of the test plots constructed at Impoundment No. 1. The need for clay capping was reassessed by the agencies in their review of GSM's 1995 Permit Application.

Stipulation No. 13: GSM must develop a final monitoring plan for Impoundment No. 1, in consultation with the agencies, which must be submitted with the 1991 Annual Report. The plan must be designed to quantify the amount and quality of seepage and effectiveness of reclamation in limiting seepage from the impoundment.

a. Parameters to be monitored include phreatic water level in the impoundment, seepage, water recharge and quality and other measures for evaluating the effectiveness of reclamation.

b. If monitoring reveals that seepage quantity and quality are substantially different from predictions, GSM must revise its treatment plans and areas, in consultation with the agencies.

GSM constructed reclamation plots on a portion of Impoundment No. 1 to monitor the amount and quality of seepage and the effectiveness of reclamation in limiting seepage. The reclamation test plot plans developed with the help of D. Dollhopf and the Montana State University Land Rehabilitation and Reclamation Department was described in Appendix M of the 1992 Annual Report. The construction included several plots using various capping materials. The monitoring plan measured water levels, seepage, and recharge with pore water samplers, neutron access tubes, and piezometers. Test plot monitoring began in the fall of 1992. A final summary report was given in Appendix 5.6-1 of GSM's 1995 Permit Application. The summary report concluded that the tailings reclamation cap designs used on the test plots were effective at minimizing infiltration of water into the tailings, and thus, would minimize the amount of seepage from the tailings that would result from direct precipitation. The tailings cap, however, does not exclude oxygen. Therefore, in time, the tailings will acidify, providing a potential for ARD seepage.

Flow rates and water quality below the tailings impoundments are routinely monitored in the pumpback wells to determine the amount and quality of seepage as described in GSM's Water Resources Report submitted annually to the agencies. As described in the reclamation plan in Appendix D of the Annual Report submitted in March 1992, Impoundment No. 1 monitoring wells will be monitored until applicable water quality standards are met as required by Stipulation No. 14. Impoundment No. 1 pumpback wells will discharge into Impoundment No. 2 during mine life, and into a permanent water treatment plant thereafter until applicable water quality standards are met (Stipulation No. 15). All treatment plans will be reviewed at the end of mine life, and a decision will be made whether the closure plans need to be modified and submitted to the agencies (Stipulation No. 24).

Stipulation No. 14: Monitoring the pumpback wells associated with Impoundment No. 1 and reclamation effectiveness in limiting seepage and control of the acidifying reaction must continue until water quality standards can be met in the applicable surface and groundwater systems.

GSM routinely monitors water quality from the pumpback systems, and a commitment to continue to monitor water quality in the pumpback systems until water quality standards can be met is contained in both the existing and proposed reclamation plans. Existing water quality data are provided in Appendix AR-95-4.3 of the 1995 Annual Report. Discharge rates from the South Pump Back (SPB) and East Flank Pump Back (EFPB) groundwater interception/pumpback systems also are routinely monitored to evaluate pumpback well operational performance. This monitoring system should continue to be an adequate means of assessing reclamation effectiveness in terms of limiting seepage and meeting water quality standards.

Stipulation No. 15: Pumpback wells for Impoundment No. 1 must operate and discharge into Impoundment No. 2 during mine life. After mine life they must be pumped to the treatment plant or other approved facility until water quality standards can be met in the applicable surface and groundwater systems.

Decommissioning of Impoundment No. 1 began when Impoundment No. 2 became available in 1994. In 1995, GSM directed all discharge from Impoundment No. 1 pumpback wells into Impoundment No. 2, unless discharge lines were temporarily under maintenance or repair. As of late 1995, GSM eliminated the backup line from the pumpback systems to Impoundment No. 1 such that pumpback water can no longer be discharged to Impoundment No. 1 under any circumstances. The existing and proposed reclamation plan incorporates plans to treat the pumpback well water after mine life prior to disposal until pumpback well water meets all appropriate water quality criteria for discharge.

Stipulation No. 16: GSM must submit within 180 days of permit issuance, detailed specifications, for agency review and approval, for the permanent design and construction of the diversion structure around the tailings impoundments. The diversion system must be designed to handle runoff from one half the Probable Maximum Precipitation Event (PMP) and must include:

- ***Diversion channel specifications;***
- ***Dam specifications, for the five drainages to be diverted to the east and west of the impoundments; and***
- ***Specifications for inlet, outlet, and gradient control structures that are required for the drainage dam reservoirs and final discharge to the natural drainages.***

Diversions must be constructed in accordance with the approved design. Annual maintenance of the diversion structures must be performed. Cost figures must be gathered during the remainder of mine life and must be used to adjust the financing for permanent water treatment to include the long-term maintenance of diversion structures.

A final design development report entitled "Supplemental Design Services, East Tailing Disposal Facility" was completed by Sergent Hauskins and Beckwith (SHB) Geotechnical Consulting Engineers of Phoenix, Arizona. Portions of the report discuss the diversion system design around both tailings impoundments. This report was submitted to the agencies on June 12, 1991, along with three construction plans showing the layout, survey data, cross-sections, and details of the design for diversion structures around both impoundments. The response to MDEQ comment number 43 in the 1992 Annual Report detailed the approval and construction work completed to date on the diversion channels around the impoundments.

Plans for Tailings Impoundment No. 1 (West Diversion) were submitted in 1988, 1989, and 1990, and approved with the permit for Amendment 008. Some modifications were made to these plans, and after considerable consultation, the agencies approved construction September 1, 1995. Construction started in late 1995 and will continue into 1997-1998.

The agencies reviewed the plans for Tailings Impoundment No. 2 (East Diversion) in 1990, and it was constructed in 1991. The main portion of the channel has functioned well; however, portions of the western one-half required repair because of bottom heaving and slope steepening from the 1994 ground movement. Grade reestablishment, channel reconfiguration, and riprapping were completed in 1996 at a cost of $25,278. The outfall on the east end will require modification after two intense thunderstorm runoff events repositioned some of the riprap and scoured the channel. A redesign of the outfall was submitted to and approved by the agencies. The outfall will be reconstructed with a slightly flatter channel slope and a bedded riprap which will prevent washing of fines from beneath and around the larger rock.

In summary, the diversions around the tailings impoundments have been designed and constructed in accordance with approved designs and should be effective at handling the designed runoff event. Annual maintenance costs are being tracked to provide data to calculate the costs for long-term maintenance.

Stipulation No. 17: GSM must submit a final grading plan, which includes cell-sizing and berm specifications, in the 1991 Annual Report which will distribute runoff from the 100-year, 24-hour storm event across the reclaimed Impoundment No. 1 and 2 surfaces to minimize both erosion and the concentration of standing water.

GSM submitted this plan under the response to Stipulation No. 17 in Chapter VII of the Annual Report submitted in March 1992. The plan also was discussed in Appendix D of this same report. The agencies evaluated GSM's compliance with this stipulation in July of 1992 and concluded that the stipulation requirements had been fulfilled.

Stipulation No. 18: GSM must initiate a test plot on Tailings Impoundment No. 1 to test the effectiveness of the approved reclamation plan and alternative reclamation scenarios that may be more effective in limiting seepage from the impoundments.

GSM constructed a series of reclamation test plots on Impoundment No. 1 during 1992 with D. Dollhopf and the Montana State University Land Rehabilitation and Reclamation Department. The test plots were designed to evaluate the effectiveness of the approved reclamation plan, as well as alternative reclamation scenarios. The test plot design and monitoring plan were fully described in Appendix M of the 1992 Annual Report and incorporates a number of features requested by the agencies. A final monitoring summary report can be found in Appendix 5.6-1 of GSM's 1995 Permit Application.

The plots tested three earthen material systems for capping and revegetating impounded tailings. Monitoring occurred through the latter part of 1993 with testing that included a simulated 10-year storm (rainfall) event. Dollhopf et al. determined that all cover systems tested were similar relative to the parameters tested and that any cover system evaluated would be effective in terms of decommissioning the tailings impoundment. It also was noted that a coversoil/borrow material system may exhibit better long-term stability than the other systems tested, which included a clay cap barrier, and that a cover soil/borrow material system may be more practical and cost "feasible" to construct.

It should be noted that the depths of the capping systems tested by Dollhopf et al. were deeper than that proposed by GSM for use at the project site. Additional on-site analyses conducted by GSM concluded that the proposed 48-inch cover depth would be adequate based on anticipated rainfall events, capillary rise potential, and the potential for revegetation success in terms of plant rooting depth and soil chemistry.

Mitigation Measure S-6 in the EIS proposes *to continue* a limited monitoring program to assess, through time, any negative changes to the applied plant growth medium.

Stipulation No. 19: Water balance in the pit must be monitored quarterly and submitted to the agencies, with inflow measurements, in the annual reports.

GSM monitored pit highwall seeps and pit dewatering discharge on a monthly basis during 1996 to characterize the occurrence of water in the pit. The monitoring results are used to verify earlier water balance modeling estimates for purposes of pit water management.

Pit seeps were difficult to monitor in 1996 due to poor access and safety concerns. However, GSM attempted to collect data on a monthly basis throughout 1996 to help predict the future occurrence and quality of pit water. A map showing pit seep locations, and seep monitoring data are provided in Appendix AR-96-4.8 of the 1996 Annual Report. The pit dewatering system consists of several sumps and shallow dewatering wells that intercept water along the pit floor, and two deeper wells located on the north highwall. The average pit dewatering rate in 1996 was approximately 37 gpm, based on inflow records of feed water to the water treatment plant in the mill facility. Pit water monitoring and reporting is ongoing.

Stipulation No. 20: Bond to assure funds for the construction and permanent operation of a permanent water treatment facility must be submitted when the pit intersects the anticipated water table at the 5,350-foot elevation. The amount of bond must be based on actuarial projections of funds required, taking into account:

- ***(a) anticipated starting date of treatment,***
- ***(b) final treatment methods,***
- ***(c) projected amount of water to be treated, which will be presumed to be 75 gpm unless data is developed which shows, to the agreement of the agencies, that the amount is different, and***
- ***(d) the costs of operation, depreciation and maintenance. If, in subsequent years, data is developed which shows, to the agreement of the agencies and GSM, that the amount of water to be treated changes from the original determination, the projection and the bond will be adjusted accordingly.***

Bond submitted in accordance with this stipulation must be converted to a permanent fund, under the control of the state, at the end of active mine operations.

Treatment of initial dewatered tailing effluents from Impoundment No. 2 was accounted for in GSM's bond submitted in June 1990. A study outlining permanent water treatment plans and expected costs at GSM was included as Appendix O in the Annual Report submitted in March 1992. This document was modified at the agencies' request to include a 10 percent contractor profit and is included as an appendix in the Stand Alone Permit document submitted in March 1993. The study covers costs to treat perpetual drainage from both the pit and tailings impoundments should it occur. In addition, treatment for initial dewatered tailings effluents was added to the study because the same treatment plant will be used.

In June 1992, GSM submitted additional bonding totaling $2,483,000 to cover pit water treatment as requested by the agencies. As described in the response to Stipulation No. 25, GSM increased its bond by an additional $945,702 June 27, 1996, for increased pit inflows.

Stipulation No. 21: As final pit walls are developed, GSM must use tree plantings on benches and talus slopes where safety, stability, and materials quality allow.

The pit continues to be active and is enlarging, and few walls can be reclaimed under current operating conditions. The commitment to plant trees on benches and talus slopes has been made in the existing and proposed reclamation plans, with conditions of safety, stability, and materials quality taken into consideration.

A reasonable revegetation success potential is assumed given the methods selected for growth medium preparation in the existing and proposed reclamation plans, including the application of an oxide cap, where necessary. It should be noted that the pit acreage to be reclaimed is limited by the availability of soil and oxide cap material of acceptable quality and quantity.

Stipulation No. 22: Water, if the volume is significant (based on final pit configuration), must be diverted around the pit perimeter in permanent diversion structures which are designed to handle 100-year, 24-hour precipitation events. The design for this diversion, or documentation of insignificant run-on, must be submitted in the 1991 Annual Report.

The system for diverting storm runoff around the pit perimeter was designed in conjunction with systems for diverting storm water off and around the dump tops (Stipulation No. 4) and for diverting storm water off the dump slopes (Stipulation No. 6). These were described under the response to Stipulation No. 22 in Chapter VII of the Annual Report submitted in March 1992. The diversion structures have been designed for and should be effective at handling 100-year, 24-hour precipitation events.

Stipulation No. 23: GSM must develop a plan, in consultation with the agencies, to identify the potential for vertical flows and fracture flows from the pit. This plan must be submitted with the 1991 Annual Report.

The plan to identify vertical and fracture flows from the pit was included with the Annual Report submitted in June 1991, in the response to Stipulation No. 9 in Chapter V. GSM has identified a potential for vertical and fracture flows from the pit. If fractures exist which provide a hydraulic connection to the colluvium, it will be necessary to maintain the pit groundwater levels at an elevation of 5,050 feet to maintain a hydrologic gradient for groundwater to flow towards the pit.

Mitigation Measure W-2 in the EIS was developed to address this issue and includes measures to prevent pit water elevation levels from exceeding 5,050 feet in elevation.

Stipulation No. 24: At the end of mine life, GSM must review the treatment plan and determine whether or not closure plans need to be modified based on data and other information accumulated during mine life. GSM's review and conclusions must be submitted to the agencies and GSM may apply for a revision. The agencies reserve the right to require a modification of the Permit under 82-4-337, MCA.

In the existing and proposed reclamation plans, GSM has committed to review the treatment plan at the end of mine life using water monitoring information from the pit, waste rock dumps, and tailing areas.

Stipulation No. 25: With each Annual Report, which must be submitted June 27 of each year, GSM must submit additional bond in the amount of $1,158,000, for the 12 years through and including 2002. In the years 2003 and 2004, $408,000 must be submitted, unless these amounts are revised by future bond evaluations and documented in writing.

In addition, the current format of the annual report must be expanded to include:

1. *reclamation data with summaries and analysis for all reclamation test plots;*
2. *as-builts required by Stipulation Nos. 3 and 4;*
3. *acid-base potential data from Stipulation No's. 5 and 6 for those years in which slope reduction and rock capping, respectively, have been implemented;*
4. *soil sampling data (Stipulation No. 7);*
5. *erosion data (Stipulation No. 8);*
6. *data and findings from monitoring of Impoundment No. 1 (Stipulation No. 13);*
7. *pumpback well data (Stipulation No. 14);*
8. *water balance data, inflows, and outflows for the pit (Stipulation Nos. 19 and 23);*
9. *soil and oxidized cap rock volumes, locations and materials balance; and*
10. *noxious weed control report.*

Data must continue to be submitted annually for as long as the related activity is underway.

GSM has been increasing its bond by $1,158,000 each year. GSM increased its reclamation bond by $1,158,000 in June 1997 to bring the total reclamation bond to $38,043,902. The total bond amount includes $948,650 of unobligated bond.

The format of the annual reports has been expanded to include each of the itemized sections above. In the existing and proposed reclamation plans, GSM has committed to continue to submit data to the agencies annually, for as long as the related reclamation activity is underway.

Stipulation No. 26: At the end of operations, GSM must test areas which have the potential to acidify and take any additional measures necessary to cover and revegetate these areas, or to channel drainage from these areas to treatment facilities, where necessary. Areas to be considered are portions of haul roads constructed through un-oxidized materials, areas around the facilities where spillage of unoxidized rock occurred, and where tailing slurry line spillage have occurred.

In the existing and proposed reclamation plans GSM has committed to test areas which have potential to acidify at the end of mine life and take additional measures necessary to cover, revegetate, and channel drainage from these areas. GSM has committed to this for all facility areas, including but not limited to the plant site/buildings area, road and utility corridors.

Stipulation No. 27: All studies identified in the stipulations above, must clearly define the study objectives, define deliverables, and identify dates by which the deliverables must be submitted.

GSM must meet annually with the DSL, the BLM, and the WQB, to discuss monitoring and research findings and to determine the need for additional modifications of reclamation.

GSM meets annually with MDEQ and BLM to discuss existing study objectives, deliverables, monitoring and research findings, and to determine the need for additional modifications to the reclamation plan.

Stipulation No. 28: GSM must submit a final plan which identifies objectives, deliverables and due dates for all reclamation test plots with the 1991 Annual Report. The plan must be developed in consultation with the agencies.

A plan was described under the response to Stipulation No. 28 in Chapter VII of the Annual Report submitted in March 1992. The description provided was reviewed by the agencies and deemed adequate.

Stipulation No. 29: GSM must submit a revised, consolidated operating and reclamation plan which reflects all of the documents identified in the first paragraph of this amendment, discussed in the May 30, 1990, EA, and related information, as well as the designs and plans required in the stipulations above, with the 1991 Annual Report.

The single-volume operating and reclamation plan submitted in 1993 now serves as an up to date summary of GSM's current operating and reclamation plan. It is updated as needed.

Stipulation No. 30: Wherever in the stipulations GSM is required to develop a study, plan, specification design or other document, that study, plan, design, specification or other document must be submitted to the Department, with copies to the BLM, for approval. Wherever approval is required, this approval requirement means that

(1) If approval is not granted, the study, plan, design, specification or other document or documentation may not be implemented and no action may be undertaken pursuant to the study, plan, design, specification or other document or documentation, and

(2) If approval is granted, GSM must conduct its operations in accordance with the study, plan, design, specification, or other document or documentation.

GSM has submitted the above-mentioned studies, plans, designs, specifications, or other documents to the agencies for approval. The single-volume operating and reclamation plan submitted in 1993 contains the current, agency-approved studies, plans, specification designs, and other documentation.

Stipulation No. 31: Prior to further disturbance, GSM must complete a level III cultural resource survey on the north half of Section 29, T2N, R3W. The survey report must be filed with the agencies no later than the 1991 Annual Report and GSM must implement the mitigation measures necessary to assure compliance with the National Historic Preservation Act, as amended.

A level III cultural resource survey was completed for T2N, R3W, Section 29, N½ by Western Cultural Resource Management, Inc. The report entitled *A Cultural Resource Inventory For A Proposed Exploratory Drill Hole Program For The Golden Sunlight Mine In Jefferson County, Montana* was submitted to DSL in November 1990. The inventory resulted in the recording of seven new sites (24JF937 to-942, -944), including two historic trash scatters and/or structures, two groups of prospect pits, an adit, and two rock cairns. An isolated find (24JF943) also was recorded. All of the sites, except 24JF711, -942, and -944 were determined ineligible to the NRHP with SHPO concurrence. Sites 24JF942 and -944 were considered eligible pending further evaluation (Warhank 1995; Huppe 1994). Site 24JF711 has been determined ineligible to the NRHP with SHPO concurrence (Wilmoth 1997).

I.D ADDITIONAL ISSUES, MITIGATION MEASURES, AND IMPACT CONCLUSIONS

Numerous issues were identified during scoping and the environmental analysis completed for this EIS. These issues, along with appropriate mitigation measures and impact conclusions, are presented below by resource discipline. These issues apply to the Proposed Action and other alternatives. A summary comparison of impacts among alternatives is presented in summary tables (II-23 and II-24) at the end of Chapter II.

Geology, Minerals, and Paleontology

***Issue:** Future slide block movement.*

Mitigation Measure G-1 provides for continued geodetic monitoring programs to detect ground movements associated with the landslide blocks at Golden Sunlight Mine, in addition to monitoring of inclinometers and piezometers. Agency notification and review of block stability would occur if any one of several criteria are exceeded. Protocols have been developed for actions to be taken if renewed ground movement is detected. This measure would provide for detection of any further ground movements in the identified slide block areas. If movement is detected, appropriate mitigation measures could be taken to re-establish stability, such as redistribution of waste rock, dewatering, recontouring, and buttress construction in slide areas.

***Issue:** Potential ground movements in the East Waste Rock Dump.*

Mitigation Measure G-2 provides for implementation of a geodetic monitoring program to detect ground movements associated with the East Waste Rock Dump area, similar to the existing program at the mine, and the measures described in Mitigation Measure G-1. If any ground movements are detected, the appropriate agencies would be notified promptly, and monitoring intervals and reporting frequencies increased as appropriate. Protocols would be developed for actions to be taken if ground movement is detected. This measure would provide for detection of any ground movements in the East Waste Rock Dump and the implementation of appropriate mitigation measures to re-establish stability.

Issue: Movement of structural foundations.

Early warning of plant site movement is being provided by Sunlight Block monitoring, as described in Mitigation Measure G-1. A stability monitoring program for the ore processing facilities also has been initiated, with specific measures to supplement the primary (Sunlight Block) movement monitoring. Mitigation Measure G-3 provides for the continuation of these monitoring programs. If adverse movement is detected, the appropriate agencies would be promptly notified, and steps taken to ensure the safety of employees and protection of the environment. This measure would provide for detection of any movements within the ore processing facilities area. If movement is detected, appropriate mitigation measures could be taken to re-establish stability, such as draining of processing fluids to the tailings impoundments, and structural refitting of facilities to accommodate movements.

Issue: Damage to tailings impoundment caps due to consolidation settlement.

Tailings impoundment consolidation over time could result in differential settlements of the impoundment reclamation caps. This, in turn, could cause ponding of surface water or disturbance of the cover in such a way as to reduce the cover effectiveness in preventing infiltration. Mitigation Measure G-4 provides for maintenance activities, including regrading of the impoundment surface in affected areas, and repair of the cover as needed to restore its function and maintain the desired slopes on the impoundment surface. This would be effective in maintaining cover integrity and function.

Issue: Construction feasibility concerns regarding pit backfilling activities under the Partial Backfill Alternative.

This issue applies only to the Partial Backfill Alternative. Worker safety and consistent cover of pit wall surfaces are concerns for the proposed placement of backfill in the pit. Mitigation Measure G-5 provides for an evaluation of potential alternative construction methods. These include backfilling by working up from the bottom of the pit, rather than end dumping, to create a more consistent fill and reduce the risks to workers. However, greater volumes of backfill material would be required, and the method may be cost-prohibitive. Another method to consider is the use of remote-controlled equipment for grading of the pit wall cover slopes, to minimize safety risks to workers. Alternative construction methods would likely entail considerable additional costs, and would not contribute to a reliable long-term reclamation plan.

Issue: Direct impacts to previously unidentified paleontological resources.

With implementation of Mitigation Measure P-1, if previously undocumented paleontological deposits are located during project operations, GSM would cease activities in the area until the resources could be examined by professional paleontologists approved by the state and/or BLM. If significant paleontological resources are identified, impacts would be mitigated through an appropriate treatment plan approved by the state and/or the BLM, or through site avoidance. This measure would allow for the evaluation of previously unknown and potentially significant paleontological deposits that may be discovered during mining activities and would provide adequate time for presentation and recovery of the resources if this is deemed necessary by the state or BLM.

Water Resources

Issue: Identification and replacement of reduced discharge or reduced water quality at springs and seeps.

Mitigation Measure W-1 provides for establishing a monitoring program to quantify discharge and water quality at springs in the project area, and to identify any reductions in flow or water quality, with data collection events frequent enough to detect spring response to seasonal variations and pit dewatering. Mitigation of reduced discharge at springs would be accomplished by further development of the affected spring or by diverting water from the permanent water treatment plant *or dewatering wells upgradient of the pit (depending on water quality)* to provide water for wildlife and livestock use. Reduced water quality would be *mitigated* by establishing additional water sources for wildlife and livestock use, using treated water discharged from the permanent water treatment plant *or dewatering wells upgradient of the pit (depending on water quality)*. This measure would document variations in spring discharge and water quality and provide data to determine if changes in spring flows or water quality are occurring as the result of mining activities. In addition, the measure would provide continued surface water sources at the mine site, greatly reducing impacts to wildlife and livestock.

Issue: Pit groundwater discharge to adjacent hydrostratigraphic units

Mitigation Measure W-2 would provide for monitoring of pit pond water levels to ensure that the pit pond elevation remains below the groundwater discharge threshold elevation of 5,050 feet. If the level exceeds this elevation, appropriate measures would be taken to reduce the pond level, including additional pumping and/or water treatment facilities. In addition, water level and quality monitoring downgradient of the pit would verify whether a maximum pond elevation of 5,050 feet is effective, or whether adjustments are needed in the proposed maximum pond elevation in order to protect groundwater outside the pit. This measure would prevent pit pond water levels from exceeding the threshold elevation, and, therefore, mitigate the potential for degradation of the surrounding groundwater.

Issue: Erosion from increased flows in stream channels due to the Sheep Rock or return diversion.

Under the Proposed Action, increased erosion could occur within Conrow Creek and the tributary to Conrow Creek, following the introduction of additional flows from Sheep Rock Creek. Under the Return Diversion Alternative, increased erosion could occur within the unnamed tributary to Sheep Rock Creek as a result of diverted flows. Mitigation Measure W-3 provides for periodic examination and maintenance of the channels, including the addition of erosion protection in affected channel reaches, and/or installation of check dams or other grade control structures. GSM has committed to visually inspecting Conrow Creek after storm events and addressing channel damage. This would apply for the unnamed tributary to Sheep Rock Creek under the Return Diversion Alternative. These measures would mitigate erosion from increased flows in affected stream channels.

Issue: ARD release from dumps that is either premature because of transport along preferential, discrete flow paths, and/or of greater flow rate than modeled performance because of higher than expected infiltration.

Mitigation Measure W-4 provides for the implementation of several measures if the data from existing monitoring wells and/or spring flows indicate that changes in water quality are occurring which are likely to exceed applicable regulatory requirements. These include:

a) If water quality impacts are detected in monitoring wells at the mixing zone boundary downgradient from the East Waste Rock Dump, a groundwater capture system similar to the system described in Appendix A for the West Waste Rock Dump would be installed. Capture of discrete plumes from the East Waste Rock Dump (from transport along preferential flow paths) would not require a well system as extensive as assumed for the West Waste Rock Dump;

b) ARD-impacted seeps may emerge at the toes of the dumps where preferential drainage paths occur within the dumps that lead to discrete "perched" saturated zones at their base. *Additional shallow monitoring wells would be placed in all topographically evident drainages down gradient of the waste rock dumps. If water quality impacts are detected in any of these shallow wells,* shallow groundwater capture systems such as toe drains would be installed within *the impacted drainages* to supplement the primary, deep capture well system. *Shallow capture wells would be permitted as an alternative to toe drains in the larger, deeper drainages such as the Sheep Rock drainage and the Rattlesnake drainage down gradient from the East Waste Rock Dump. Toe drains must extend completely through the surficial alluvial materials to bedrock in the West Waste Rock Dump area, and toe drains or capture wells must extend through the alluvial/colluvial materials to the underlying Bozeman sediments down gradient from the East Waste Rock Dump. Water collected in the toe drains and capture wells would be conveyed by gravity flow pipelines to the water treatment plant, or to a centralized sump area from which collected water would be pumped to the treatment plant; or*

c) *In situ* treatment systems would be installed in the shallow ("perched") aquifer zones, including the alluvial materials over bedrock on the west side, and/or the colluvial/alluvial materials in Rattlesnake Gulch or at other locations downgradient of the East Waste Rock Dump.

These supplemental groundwater capture systems would allow interception of contaminated groundwater that bypasses the primary capture well system, and capture of these potential ARD sources before the contaminated water migrates downgradient to beneficial uses, or to sensitive receptors, such as the Jefferson River.

Issue: Impacts to beneficial uses of water downgradient of capture system because of capture drawdown effects.

Mitigation Measure W-5 provides for *recharging the aquifer downgradient of the capture system using water treatment plant effluent and/or water discharged from dewatering wells upgradient of the pit, and/or discharging these water sources as surface water within the mixing zone boundaries in a manner that provides for wildlife/livestock beneficial uses.* This measure would minimize impacts to beneficial uses of water downgradient of the groundwater capture system.

Issue: Total of combined inflows to water treatment plant exceed the capacity of the plant.

Mitigation Measure W-6 provides for reevaluating the capacity of the permanent water treatment plant and incorporating results into the final design within two years prior to mine closure. At that time, the actual rate and quality of pit inflow during peak flow and low flow periods, and the total rate and quality of groundwater captured in the tailing area will be better known. Based on the degree of uncertainty of the rate of inflow from future sources, a contingency measure of up to 25 percent additional flow would be incorporated into the treatment plant capacity, and a contingency to provide storage for up to 6 months of anticipated water inflow would be included. This would provide for time to modify the plant if needed for unanticipated future inflows. Alternatively, a new, additional water treatment facility would be constructed to address treatment of a specific source or sources, to be built at the time such sources are identified. Sufficient additional water treatment capacity, whether added to the permanent water treatment plant design or as an additional separate facility, would provide for treatment of unanticipated inflows.

Issue: Cracking of tailings impoundment covers due to dislocation and/or freeze-thaw effects.

This issue applies only to the No Action Alternative, which requires an 18-inch clay layer in the tailings impoundment covers. Mitigation Measure W-7 provides for replacing the 18-inch clay layer of the cover for Tailings Impoundment No. 1 with an additional 18 inches of agency-approved alluvial borrow material. The additional 18-inch layer of alluvial borrow material is not needed for the lined Tailings Impoundment No. 2. Field studies indicate that this will enhance the cover system over the unlined Tailings Impoundment No. 1 and help to minimize the seepage that needs to be collected and pumped back for treatment. All other alternatives, except the No Action, utilize the cover described in this mitigation measure.

Issue: Leakage from HDPE liner system underlying Tailings Impoundment No. 2 and reclaim ponds.

Mitigation Measure W-8 provides that if the data from existing monitoring wells indicate that the Tailings Impoundment No. 2 and/or reclaim ponds liners are leaking, pumpback wells would be installed as needed to effectively contain any impoundment fluid plumes. The additional pumpback flows would have to be treated in an enlarged or supplemental water treatment facility, as described under Mitigation Measure W-6. Groundwater interception and pumpback have been shown to be effective for controlling seepage from Tailings Impoundment No. 1, and would likely also be effective for containing leaks from Tailings Impoundment No. 2 and/or the reclaim ponds.

Issue: Preventing contact between natural groundwater and tailings material in Tailings Impoundment No. 1 in order to reduce or eliminate the mobilization of cyanide, TDS, and ARD constituents.

Mitigation Measure W-9 provides for constructing a trench-drain upgradient of Tailings Impoundment No. 1 prior to mine closure, in order to intercept groundwater associated with an historic spring at the north end of the unlined impoundment and route the water by gravity drainage to a percolation pond away from the impoundment area. This measure would lower the groundwater table downgradient of the drain and beneath the former spring area such that the hydraulic contact between groundwater and tailings is eliminated. The success of this system would be monitored for a sufficient amount of time prior to mine closure so that the results could be incorporated into the final design of the water treatment plant. Alternately, one or more dewatering wells could be constructed through the tailings impoundment in the former spring area. This measure would reduce the amount of cyanide, TDS, and ARD constituents that could be mobilized in groundwater beneath the impoundment.

Issue: Identification of bedrock fractures to optimize efficiency of the west side groundwater capture system.

Mitigation Measure W-10 provides for conducting a hydrogeologic investigation of the bedrock hydrostratigraphic unit on the west side of the project area in order to identify major water-bearing fractures for purposes of monitoring and future groundwater capture of dump seepage. The results of the study would be used to determine optimum groundwater monitoring locations and to design a groundwater capture system to prevent impacts to beneficial water uses. These measures would increase the efficiency of the proposed groundwater capture system.

Issue: Damage to the permanent diversion of Sheep Rock Creek at less than the design flows (one-half PMF), exposing waste rock to surface water flows.

Mitigation Measure W-11 provides for scheduled operational inspections to monitor any damage which occurs to the permanent diversion channels during flow events less than the designated design flow criteria. Any such damage would be repaired as part of scheduled operational maintenance activities. These measures would allow timely repair of any damage to channels which could compromise their intended performance.

Soils and Reclamation

Effects of steam venting on soils and vegetation of reclaimed waste rock dump surfaces.

Mitigation Measure S-1 provides for implementing a program for the continued monitoring of *reclaimed* waste rock dumps (including test plots) to further assess the impacts, if any, that steam venting may have on reapplied soil or establishing vegetation. The program would consist of agency reclamation specialists *annually* monitoring the number, location, size, *and gas emissions* of steam vents and the extent of modified plant communities surrounding vent locations. If detrimental effects to establishing vegetation communities are observed on more than 0.1 percent of the total reclaimed area covering acid-producing materials, GSM would be required to rock armor vent locations, conduct sampling and testing of soils, and prepare a plan for reducing impacts. Soil parameters to be tested would include, at a minimum, soil pH and ABA. The cost for the program should be included in a post-mine maintenance bond. This measure would be an effective means of assessing and mitigating the changes occurring as a result of steam venting.

Issue: Salvaging or providing a sufficient volume of oxide rock, soil, or borrow material for capping needs under the No Action Alternative.

Under Mitigation Measure S-2, GSM would include in its bond *submittal, funds providing for the salvage of* a sufficient volume of oxide rock, soil, or borrow material to make up for the projected shortfalls of suitable capping material under the No Action Alternative. This would *ensure the agencies could* provide for sufficient capping needs and would promote reclamation success.

Issue: Salvaging a sufficient volume of soil (or borrow material) for reclamation under the No Action Alternative and Divided Dump Alternative (minimum disturbance scenario).

Mitigation Measure S-3 requires that the agency engineer identify which soil stockpiles and which areas to be resoiled would be affected by the projected soil or borrow material shortfall. A salvage area would then be identified and a bond calculation made to recover the needed volume of soil or borrow material at the time of reclamation. This measure would *ensure GSM* provided sufficient bond funds *for the agencies* to address the soil volume shortfalls and would promote reclamation success.

Issue: Providing for application of soils containing high (up to 50 percent by volume) rock fragment contents on 2:1 and 3:1 waste rock dump slopes as a part of the reclamation cap proposed for waste rock dumps.

Mitigation Measure S-4 provides that, based on the results of on-site studies, GSM use soils containing high (up to 50 percent by volume) rock fragment contents as part of the reclamation cap proposed for waste rock dumps. A combination of alternate erosion control techniques may be used in lieu of the proven high rock fragment content soils, if it can be shown that the substituted technique(s) will provide the same effect with regard to reducing erosion potentials on reclaimed slopes. This measure should be highly effective in reducing erosion potentials for reclaimed areas, particularly on steep slopes.

Issue: Providing for mulch or a "mulch effect" as a part of the revegetation sequence proposed for disturbed areas during the reclamation phase of this project.

Mitigation Measure S-5 provides that, based on the results of on-site test plot studies, GSM include mulching as part of the revegetation technique sequence proposed for disturbed areas at the project site. A combination of alternate mulching, cover crop, or seedbed manipulation techniques may be used in lieu of the proven mulching technique, if it can be shown that the substituted technique(s) will provide the same effect with regard to reducing erosion potentials and increasing revegetation success. This measure should be highly effective in increasing revegetation success potential for disturbed areas, particularly steep slopes.

Issue: Long-term success of waste rock and tailings revegetation using oxide waste rock and borrow material capping.

Mitigation Measure S-6 provides for the continuing evaluation of existing waste rock test plots (initiated by Schafer and Associates) to assess the effectiveness of waste rock capping techniques developed on-site. Several specific parameters *would* be assessed in order to determine if detrimental changes are occurring within the root zone through time. Plant cover and species composition assessments *would* continue, and estimates of erosion also *would* be included. A similar but abbreviated monitoring effort *would* be conducted at the tailings facility and selected waste rock dump sites to assess the potential for capillary rise from the tailings into the reapplied soil materials and acidification of reapplied soil over waste rock, respectively. The length of time for monitoring *would* be determined by *the agencies based on monitoring results and trend analysis.* This measure would be a highly effective means of assessing the changes, if any, in seedbed materials through time as a result of the chemical characteristics of the material over which the soils were applied.

Issue: Reducing erosion potential on reclaimed slopes by reducing slope length between benches.

Mitigation Measure S-7 provides for reducing slope length from 200 to 100 vertical feet between benches. This would reduce slope length to 225 feet on 2:1 slopes and 320 feet on 3:1 slopes. This would apply to all slopes regardless of gradient. Currently reclaimed areas would not be changed unless erosion proves to be a future problem. Other measures could be added to existing reclaimed slopes, such as additional surface rock mulches, rock breaks applied on slopes, etc., to produce the same effect as additional benches. This measure would reduce the erosion potential on reclaimed slopes and would also allow for additional access to maintain slopes, if needed.

Vegetation and Wetlands

No mitigation measures are proposed for vegetation. See Appendix N for a detailed description of wetland mitigation measures.

Wildlife and Fisheries Resources

Issue: Potential bat and avian contact with poor quality pit water.

Mitigation Measure WF-1 requires that, when the pit lake forms, a monitoring program is implemented to determine whether wildlife species are utilizing the pit lake for foraging or other activities. If this occurs, a hazing program similar to that used for the tailings impoundments would be developed and implemented. This measure would minimize the impacts to bat and avian species from contact with poor quality pit water.

Issue: Loss of potential bat habitat.

Mitigation Measure WF-2 requires conducting an inspection or survey of existing mine shafts and adits prior to initiation of mining activities in order to determine bat occupancy. GSM would notify the BLM prior to closing any shafts, adits, or man-made structures on BLM-managed land during mine operation. BLM would determine whether additional protection measures are necessary to prevent impacts to bat species that may inhabit these areas. These measures would prevent any direct impacts to bat species that may occupy abandoned underground openings. Long-term, indirect impacts would still occur.

Issue: Loss of raptor nesting habitat.

Under Mitigation Measure WF-3, raptor surveys would be conducted during the breeding season prior to the initiation of mining activities on previously undisturbed lands between March 1 and August 15. If an occupied breeding territory or active nest site is located, restrictions would be applied to all disturbance activities during the breeding season. Measures would be identified by the agencies to protect breeding raptors, possibly including construction constraints within 0.5 mile of nests during the sensitive early periods of the breeding season (e.g., courtship and incubation). The historic raptor nest located north of the tailings impoundment should be avoided. If it cannot be avoided, this nest should be removed outside the active breeding season (March 1 to August 15). These measures would prevent disturbance of, and minimize the loss of annual productivity for breeding raptors.

Issue: Loss of migratory bird nesting habitat.

Under Mitigation Measure WF-4, removal of native vegetation on previously undisturbed lands would be prohibited between May 1 and July 31 to protect actively nesting migratory birds. Alternatively, breeding bird surveys approved by the agencies could be conducted during the breeding season and prior to site disturbance to identify whether occupied territories or active migratory bird nest sites could occur within the areas to be disturbed. If nesting migratory birds are not located during the survey, construction could proceed. If nesting migratory birds are found, GSM would coordinate with the agencies and based on the bird species detected, the agency biologist would make recommendations on whether appropriate protection measures should be implemented (e.g., avoidance). These measures would be effective in minimizing the direct loss of migratory birds and identifying any sensitive breeding areas prior to site disturbances.

Threatened, Endangered, and Candidate Species

Mitigation Measures WF-1 and WF-2 discussed in the Wildlife and Fisheries Resources section above also apply to this resource. No additional mitigation measures are proposed.

Air Quality

No mitigation measures are proposed for this resource.

Land Uses and Plans

No mitigation measures are proposed for this resource.

Aesthetic Resources

No mitigation measures are proposed for this resource.

Social and Economic Resources

No mitigation measures are proposed for this resource.

Hazardous Materials and Wastes

Issue: Generation of unnecessary hazardous waste due to spills of hazardous materials onto soils.

Under Mitigation Measure HM-1, all hazardous materials would be stored in a berm lined with an impermeable layer, rather than a soil or gravel berm. Spills within the containment berm could then be recovered with a vacuum truck and either recycled or disposed of *consistent with HWMA requirements.* This measure would reduce the impacts due to spills around tanks and storage vessels.

Issue: Generation of unnecessary hazardous waste due to drainage from routine maintenance operations.

Under Mitigation Measure HM-2, the impacts to soil from the drainage of areas such as equipment/truck wash stations and equipment maintenance facilities would be mitigated by collecting and draining all washout/runoff from the area into an oil/water separator before discharge to surface waters. Paving these areas such that washout/runoff collected in a central drain also would eliminate the impact to soil. Used oil sludge could then be recovered with a vacuum truck and either recycled or disposed of as necessary. This measure would reduce the impacts from the uncontrolled runoff of equipment wash rinsate.

Issue: Generation of unnecessary hazardous waste due to improper handling and/or response to hazardous material spills.

Under Mitigation Measure HM-3, the impacts from a minor spill of hazardous material would be mitigated by training all personnel in the proper reporting and response requirements. Rapid and appropriate response to minor releases of hazardous material would reduce the amount of soil and/or water that would be impacted. Requiring all personnel to have OSHA hazardous material training would reduce the chance of accidents in storage and transport of hazardous materials and increase overall safety.

Cultural Resources

Issue: Direct impacts to known cultural resources.

Mitigation Measure C-1 provides for conducting data recovery at NRHP sites eligible under criteria "d" directly impacted by mining activities, to be carried out in accordance with a formal treatment plan prepared by a professional archaeologist and approved by the BLM, the MDEQ, the SHPO, and the ACHP prior to project commencement. Mitigation for directly affected sites eligible to the NRHP under criteria a, b, and c also would be addressed in a treatment plan. This measure would mitigate adverse effects from direct impacts through data recovery, collection of available site information, and educational measures as determined on a site by site basis, and would meet legal requirements under 36 CFR 800.

Issue: Indirect impacts to cultural resources from mining activities.

Mitigation Measure C-2 would provide for limiting access to archaeological sites on private land, education of GSM employees as to the fragile nature of cultural resources, and a strict GSM management policy regarding casual collecting of artifacts from project lands. This measure would reduce, but not eliminate, indirect impacts to cultural resources on both public and private lands.

Issue: Surveying of project areas previously uninventoried.

Under Mitigation Measure C-3, Class III surveys would be conducted by qualified archaeologists in those areas of Section 36 that have not been previously inventoried if disturbance in those areas is planned (applicable to the Divided Dump Alternative). Surveys would occur before disturbance and before issuance of the ROD. Any potential effects to sites identified in these areas would be considered through the Section 106 process. This measure would identify and assist in mitigating adverse effects to currently unidentified sites that may occur in the unsurveyed areas.

Native American Concerns

Issue: Consultation on previously unidentified sites of potential significance to Native Americans.

Mitigation Measure NA-1 provides for consultation with local tribal representatives if Class III field surveys in Section 36 (see Measure C-3) identify sites of potential concern to Native Americans. Consultation would be conducted to determine if the sites should be considered important traditional cultural properties, and if so, to further determine the appropriate mitigation measures to avoid adverse impacts. The measure would assist in identifying and mitigating adverse effects to currently unidentified sites that may be of significance to Native Americans.

I.E AGENCY-PREFERRED ALTERNATIVE

The agency-preferred alternative is the Proposed Action as modified by the Return Diversion and No Pit Pond alternatives, with all appropriate mitigation. The rules and regulations implementing MEPA and NEPA (A.R.M. 17.4.617 and 40 CFR 1502.14, respectively) require that the agencies indicate a preferred alternative ***in the Draft EIS***, if one has been identified, ***and in the Final EIS prepared for the project***. The preferred alternative ***is not a final agency decision; it is rather an indication of the agency's preference at this***

ties. The alternatives identified above are the agencies' preferred alternative at the Final EIS stage in the environmental review process. The agencies' preference considers all information that has been received and reviewed relevant to the proposed project, and all comments received on the Draft EIS.

Rationale for Selection

- The Proposed Action best achieves Golden Sunlight's goals for developing its gold reserves. Waste rock dumps reclaimed at the proposed combination of 3:1 and 2:1 slopes are expected to be stable. The oxide rock and soil cap on the dumps provides an adequate medium for revegetation and should minimize soil erosion and water infiltration.

- The Return Diversion alternative, as it modifies the Proposed Action, avoids potential erosion and channel damage problems associated with the proposed diversion of upper Sheep Rock Creek into the tributary of Conrow Creek. The Return Diversion alternative avoids placement of acid-generating waste rock in adjacent drainages, as could occur under the Divided Dump alternative, thus concentrating in a smaller area the anticipated impacts to groundwater associated with ARD seepage from the dumps.

  Disturbance to the school trust surface estate would be minimal. A temporary soil stockpile is proposed to be placed on State Section 16 (T2N, R3W). GSM must obtain a land use license from DNRC before constructing this stockpile. DNRC has concluded that commercial/economic metalliferous and/or nonmetalliferous mineral deposits are not present in those portions of the state mineral estate that would be affected.

- The No Pit Pond alternative further modifies the Proposed Action to better handle the problem of objectionable effluents from the mine by eliminating the lake of poor quality water that would have formed in the pit after mine closure. This in turn eliminates a potential significant impact to wildlife that might have otherwise come in contact with the pit water.

Select Mitigation Measures

If this alternative is implemented, the following mitigation measures would likely be applied.

- ARD seepage from the existing waste rock dumps as well as from proposed dump expansions is expected in the future. The minimum practicable groundwater mixing zone would be determined and granted. In order to achieve the minimum size for the mixing zone, additional geotechnical and geohydrological characterization of the hydrostratigraphic units downgradient of the waste rock dumps would be performed for both the west and east waste rock dump complexes. This measure would improve the precision of placement and the effectiveness of monitoring and capture wells within the mixing zone by delineating fracture systems and other preferential flowpaths that could allow ARD to move more easily and with less likelihood of being naturally buffered. The mixing zone boundaries would be further refined in accordance with the new information obtained.

- Water quality and quantity at existing springs would be monitored. If springs deteriorated, replacement water would be supplied from the water treatment plant, or new sources would be developed. Decreases in water for such beneficial uses as wildlife and livestock watering, due to groundwater drawdown from capture wells and pit pumping, would be compensated for by providing water from the water treatment plant.

  The design for the return diversion would be refined to improve stability and efficiency and reduce maintenance requirements. Refinements could include: sizing to carry extreme runoff; excavating into bedrock to improve stability; building to gradients that more closely approach the gradients of the existing channel to improve the diversion's function as a stormwater drain and reduce sediment buildup and down cutting, and; lining or grouting to reduce infiltration and improve stability.

In tentatively selecting the preferred alternative and these mitigation measures, the agencies have focused on their major legal requirements under such laws as the Metal Mine Reclamation Act, the Water Quality Act, and the Clean Water Act and the issues that pertain to these requirements. Other issues and possible mitigation measures remain under consideration and will be addressed in the Record of Decision.

Pit Reclamation Feasibility

The Partial Backfill Alternative was analyzed in compliance with the Court Order of September 1, 1994 to evaluate the feasibility of pit reclamation, and pursuant to subsequent amendments to the Metal Mine Reclamation Act [at 82-4-336(7), MCA]. Partial backfilling is technically feasible as a method of pit reclamation.

With regard to economic feasibility, GSM provided MDEQ with engineer's cost estimates to accomplish the partial backfilling and reclamation of the pit as described in Chapter II of this Draft EIS. A staff engineer for MDEQ found the cost estimates to be reasonable.

MDEQ contracted an independent certified public accountant to review proprietary economic information provided by GSM containing income and cash flow projections based on the mine's historical costs, a range of gold prices, and the assumption that mining would continue as proposed and that the pit would subsequently be backfilled. MDEQ determined that a positive return on investment in the mine would be the initial threshold for determining the economic feasibility of backfilling. If partial backfilling would eliminate any reasonable likelihood of realizing a positive return on investment, backfilling would be considered uneconomic.

The certified public accountant found GSM's economic information to be reasonable and found nothing to suggest that the underlying assumptions were not reasonable. The projections indicate that a positive rate of return for continued mining under the Proposed Action would be realized only if the price of gold was sustained at $400 per ounce during the analysis period of 1997 through 2003. The return on investment would be very small for the period.

Fluctuations in gold prices will affect the results of the Proposed Action more than any other single factor. Current market indications suggest that the price of gold will average around $350 per ounce through the period with little to suggest an upturn in the near future.

A sustained gold price of $350 per ounce for the period would result in a net loss under the Proposed Action, though with a positive cash flow. This is typical of a mining operation which requires a large initial investment that is recovered over the life of the mine. With gold at $350 per ounce and the requirement to partially backfill, GSM would not be able to recoup its initial investment at a profit.

Based on the analysis summarized above, it does not appear that there would be any reasonable likelihood of GSM realizing a positive return on investment. Therefore, it has been determined that partial backfilling is not an economically feasible method of pit reclamation. Consequently, the agencies' preferred alternative does not include partial backfilling.

II CONSULTATION AND COORDINATION

II.A FINAL EIS REVIEW

In the course of preparation of the Draft and Final EISs for the Golden Sunlight Mine Project, the MDEQ and the BLM communicated with and received input from many federal, state, and local agencies; elected representatives; environmental and citizens groups; industries; and individuals. Approximately 300 copies of the Draft EIS and/or summary were distributed by mail in November 1997 to various agencies, organizations, and individuals. During the 60-day public comment period, the agencies received both written and verbal comments on the Draft EIS. Those comments are presented and responded to in the following sections. Approximately 500 copies of the Final EIS were distributed in April 1998 to agencies, organizations, and individuals on the distribution list below.

Agencies, Organizations, and Individuals Who Received Copies of the Final Environmental Impact Statement

Federal Agencies

Library of Congress - Washington, D.C.
U.S. Department of Agriculture
    Forest Service - Ogden, UT
U.S. Department of Defense
    Army Corps of Engineers - Omaha, NE; San Francisco, CA
    HQ - USAF/LEEV - Washington, D.C.
    Office of Deputy A/S of the USAF - Washington, D.C.
U.S. Department of Energy
    Office of Environmental Compliance (EH-23) - Washington, D.C.
U.S. Department of the Interior
    Bureau of Land Management - Billings, MT; Butte, MT; Lewistown, MT; Spokane, WA; Washington, D.C.
    Bureau of Reclamation - Denver, CO
    Fish and Wildlife Service - Billings, MT; Washington, D.C.
    Minerals Management Service - Washington, D.C.
    National Park Service - Washington, D.C.
    Natural Resources Library - Washington, D.C.
    Office of Environmental Policy and Compliance - Washington, D.C.
    Office of Public Affairs - Washington, D.C.
U.S. Environmental Protection Agency - Helena, MT; Denver, CO; Washington, D.C.
    Office of Federal Activities - Washington, D.C.
    Region VIII Office - Denver, CO
U.S. Geological Survey - Reston, VA
U.S. Government Printing Office - Washington, D.C.

State Agencies

Department of Commerce, Hard Rock Impact Board - Helena, MT
Environmental Quality Council - Helena, MT
Montana Chamber of Commerce - Helena, MT
Montana College of Mineral Science and Technology - Butte, MT
Montana Department of Environmental Quality - Helena, MT
Montana Department of Fish, Wildlife, and Parks - Helena, MT
Montana Department of Natural Resources and Conservation - Helena, MT (5 copies)
    Minerals Management Bureau

Special Uses Management Bureau
Central Land Office
Water Rights Bureau
Montana State Library - Helena, MT
Montana State University - Bozeman, MT
Montana Tech of the University of Montana - Butte, MT
Montana Tech Library - Butte, MT
State Historic Preservation Office - Helena, MT

County Agencies

Jefferson County Commission - Boulder, MT
Jefferson Valley CD - Whitehall, MT
Madison-Jefferson County Extension Office - Whitehall, MT

Local Agencies

Boulder Community Library - Boulder, MT
Bozeman Public Library - Bozeman, MT
Butte Chamber of Commerce - Butte, MT
Butte Public Library - Butte, MT
John Gregory Memorial Library - Whitehall, MT

Elected Officials

Chief Executive, City and County of Butte-Silver Bow, Jack Lynch - Butte, MT
Commissioner Leonard Wortman - Boulder, MT
Commissioner Glenna Obie - Clancy, MT
Commissioner Sam Samson - Boulder, MT
Governor's Office - Helena, MT
Honorable Jack Rea - Three Forks, MT
Representative Duane Grimes - Clancy, MT
Representative Larry Grinde - Lewistown, MT
Representative Scott Orr - Libby, MT
Representative Joe Quilici - Butte, MT
Senator Mack Cole - Hysham, MT
Senator Mike Foster - Townsend, MT
Senator Chuck Swysgood - Dillon, MT

Tribal Organizations

The Confederated Salish and Kootenai Tribes of the Flathead Nation - Pablo, MT
Crow Indian Reservation - Crow Agency, MT
Shoshone-Bannock Tribes - Fort Hall, ID

Organizations

Alliance for the Wild Rockies - Missoula, MT
Center for Environmental Programs - Bowling Green, OH
Continental Divide Trail - Baltimore, MD
CURE - Whitehall, MT
Institute for Policy Research - Evanston, IL

International Union of Operating Engineers - Helena, MT
MEIC - Helena, MT
Mineral Policy Center - Bozeman, MT
Montana Contractors' Association, Inc. - Helena, MT
Montana Mining Association - Helena, MT
Montana Petroleum Association - Helena, MT
Montana River Action Net. - Bozeman, MT
Montana Wildlife Federation - Ramsey, MT
National Wildlife Federation - Missoula, MT
Northern Plains Resource Council - Dillon, MT; Billings, MT
People for the West - Pueblo, CO
Pintler Audubon Society - Twin Bridges, MT
Western Environmental Trade Association - Helena, MT
Western Mining Action Project - Boulder, CO

Industries/Businesses

Adrian Brown Consultants - Denver, CO
AFFCO - Anaconda, MT
ARCO Environmental Remediation LLC - Anaconda, MT
ASARCO Incorporated - East Helena, MT; Troy, MT
Barretts Minerals Inc. - Dillon, MT
Big Iron Equipment & Repair - Whitehall, MT
Boart Longyear Company - Salt Lake City, UT; Otis Orchards, WA
Bozeman Chronicle - Bozeman, MT
Butte Local Development Corp. - Butte, MT
Cardwell Store & RV Park - Cardwell, MT
Cedar Creek Associates - Fort Collins, CO
Christiansen, Moore, Cockerell, & Cummings - Kalispell, MT
Cyprus Amax Minerals - Englewood, CO
Dale E. Scholz, Inc. - Helena, MT
Dickinson Equipment Co. Inc. - Bozeman, MT
Dyno Nobel Intermountain, Inc. - Gillette, WY
Eastern Electric Apparatus Repair Co. - Spokane, WA
Energy Laboratories, Inc. - Billings, MT
ESA Consultants - Fort Collins, CO; Bozeman, MT
Flolder Oil Company, Inc. - Deer Lodge, MT
John W. Gebelman & Associates, Inc. - Danville, CA
Golden Sunlight Mines, Inc. - Whitehall, MT
Gough, Shanahan, Johnson & Waterman - Helena, MT
Independence Mining Co. - Englewood, CO
Interstate Diesel Products - Missoula, MT
Koocanusa Land Use Planning and Design, Inc. - Moscow, ID
J. Kuipers Engineering - Butte, MT
KTVM - Butte, MT
Liberty Pipe Co. - Great Falls, MT
Maxim Technologies, Inc. - Helena, MT
McDonald Gold Project - Lincoln, MT
Mediation & Public Management - North Ogden, UT
Midland Implement Company - Billings, MT
Minex - Belgrade, MT
Montana Power - Butte, MT

Montana Resources - Butte, MT
Mountain Labs - Bozeman, MT
Northwest Drilling - Belgrade, MT
Northwest Parts and Rigging - Kalispell, MT
O'Keefe Drilling - Butte, MT
Parsons, Behle, & Latimer - Salt Lake City, UT
Payne Machinery, Inc. - Libby, MT
Pegasus Gold Inc. - Jefferson City, MT; Zortman, MT
Phelps Dodge Corp. - Phoenix, AZ
Placer Dome U.S. Inc. - Elko, NV
Reynolds, Motl, Sherwood and Wright - Helena, MT
Rodig Minerals, Inc. - Billings, MT
SAIC - Helena, MT; McLean, VA
T-G's IGA - Whitehall, MT
Tom Carey Cattle Co. - Boulder, MT
Tractor & Equipment Co. - Billings, MT
Truly Professional Janitorial - Butte, MT
Carl Weissman & Sons - Great Falls, MT
WESTECH - Helena, MT
Whitehall Ledger - Whitehall, MT
Whitehall Medical Clinic - Whitehall, MT
Yellowstone Mine, Luzenac America - Cameron, MT

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Charlene Lopez - Englewood, CO
Amber L. Mabbott - Bozeman, MT
Mark & Carole Mackin - Helena, MT
Michael W. Madden - Anaconda, MT
John Magnus - Sheridan, MT
Thomas M. Malloy - Butte, MT
James R. March - Butte, MT
Robert L. Marks - Clancy, MT
Bret Marshall - Cardwell, MT
Nondy Mason - Whitehall, MT
Michael McCarthy - Butte, MT
Jay McCloskey - Butte, MT
Wade McCord - Silver Bow, MT
Robin McCulloch - Butte, MT
Robert McDowell - Cardwell, MT

Noelle L. Maier - White Sulphur Springs, MT
Sherrie Mihelich - Butte, MT
Floyd T. Miller - Anaconda, MT
Rodney Mills - Whitehall, MT
Rick Morphew - Whitehall, MT
Robert Moran - Golden, CO
Howard and Pat Mulligan - Cardwell, MT
Tim Mulligan - Whitehall, MT
Dave Murphy - Winnemucca, NV
Tom Naegele - Butte, MT
Phillip A. Nebeker - Anaconda, MT
Chris M. Nelson - Whitehall, MT
Joanne Nelson - Whitehall, MT
Robert Nevin - Whitehall, MT
Joe Newman - Cardwell, MT
Joe Nicholls - Whitehall, MT
Steven P. Odden - Anaconda, MT
Melissa S. Olson - Whitehall, MT
Marie Olson - Whitehall, MT
Tom Palakovich - Whitehall, MT
Doug Parker - Missoula, MT
Diane Parks - Whitehall, MT
Richard A. Parks - Whitehall, MT
John Parrish - Whitehall, MT
Kenneth R. Paulsen -Arvada, CO
John Perlog - Whitehall, MT
Bob Peterson - Whitehall, MT
Ronald G. Peterson - Anaconda, MT
Joseph S. Podobnik - Anaconda, MT
Marian Poff - Whitehall, MT
Dennis Potter - Seaside, CA
Janice E. Pribil - Anaconda, MT
Rudd O. Proctor - Anaconda, MT
Dean Pryor - Whitehall, MT
Harvey E. Reed - Billings, MT
Dan & Sarah Ream - Whitehall, MT
Tony Rice - Butte, MT
Chris D. Richardson - Whitehall, MT
Ron Richardson - Whitehall, MT
David Richerson - Deer Park, TX
Daniel S. Ricketts - Anaconda, MT
Marie F. Risher - Whitehall, MT
Richard Roberts - Whitehall, MT
Tom Roark - Butte, MT
Ed Ruckelshaus - Whitehall, MT
Ray A. Ruckelshaus - Whitehall, MT
Kenneth A. Rudd - Dillon, MT
Edward T. Ruppel - Twin Bridges, MT
Tony A. Saile - Anaconda, MT
Ray L. Sandlin - Philipsburg, MT
Harold Sant - Whitehall, MT
Darrell Scharf - Whitehall, MT

L. Benjamin Scholz - Butte, MT
Paul Seccomb - Butte, MT
Mary E. SeGraves - Whitehall, MT
Jane Severance - Whitehall, MT
Rickey R. Sharkey - Whitehall, MT
Charlene Sheley - Ramsay, MT
Earl Sheley Jr. - Whitehall, MT
Frank Sheley - Ramsay, MT
Ed Simon - Cardwell, MT
Bob Sims - Boulder, MT
Connie Sims - Boulder, MT
Keith Smith - Deer Lodge, MT
Larry D. Smith - Whitehall, MT
Olive L. Smith - Whitehall, MT
Paul Smith - Whitehall, MT
Richard A. Smith - Whitehall, MT
Wayne E. Smith - Anaconda, MT
Ben E. Stoll - Whitehall, MT
Bruce M. Stredwick - Anaconda, MT
Cody D. Swainston - Anaconda, MT
Donald B. Swanson - Anaconda, MT
Michelle & Norman Tebay - Whitehall, MT
John J. Tomich - Butte, MT
Travis J. Traub - Whitehall, MT
Ron Tuchimas - Whitehall, MT
Mike & Doloris Tuttle - Whitehall, MT
Sheryl Uphus - Whitehall, MT
Ramona L. Vandiver - Anaconda, MT
Cory J. Vollmer - Anaconda, MT
Dan L. Walker - Billings, MT
Deanna M. Wall - Whitehall, MT
Mike Wall - Whitehall, MT
Shaun Wall - Helena, MT
Mabel Webster - Whitehall, MT
Lonnie Weidinger - Whitehall, MT
Kerry Weightman - Whitehall, MT
Joseph H. Weist - Anaconda, MT
Jacqueline Wiedemeyer - Whitehall, MT
John Williams - Portland, OR
Marcus Williams - Whitehall, MT
Dan J. Wyant - Anaconda, MT
Delbert W. Wyant - Anaconda, MT
Doug Young - Pony, MT
Larry G. Young - Pony, MT
Rita J. Zanol - Anaconda, MT

II.B PUBLIC COMMENTS AND RESPONSES

During the public comment period from November 21, 1997, to January 21, 1998, the MDEQ and BLM received a total of 289 comment letters addressing the Draft EIS and petitions with approximately 1,346 signatures in support of the proposed project. In addition, comments were presented during a public hearing held in Whitehall, Montana, on January 5, 1998. The hearing had approximately 100 attendees, 28 of whom presented verbal comments on the Draft EIS. Several of the speakers also submitted their comments in writing. Comments from the hearing are summarized in a Hearing Report, reprinted with the comment letters in this section.

The MDEQ and BLM have reviewed and considered all comments submitted in determining the Agency-Preferred Alternative for the proposed project. For this Final EIS, all letters and public comments were reviewed and comments requiring a response were identified. This section presents all comments submitted and the responses prepared.

Responses were provided to clarify the contents of the Draft EIS, modify or correct the Draft EIS, or provide additional information in the Final EIS. Comments that did not require one of these responses but may be relevant to the agencies' ultimate decision regarding the Golden Sunlight Project were acknowledged. Changes to the text contained in the Draft EIS, including modifications, corrections, or additions, are presented in Chapter III of this document. Because this is an abbreviated Final EIS, it is necessary to use the Draft EIS in conjunction with this document in order to fully understand the information presented here.

Table 2-1 lists the speakers at the public meeting and the authors of the comment letters. Each has been assigned a reference number. Comments were arranged according to the following:

- Hearing Report
- Federal Agencies
- State Agencies
- County Agencies
- Local Agencies
- Elected Officials
- Organizations
- Industries/Businesses
- Individuals

Within each group, letters containing substantive comments (i.e., requiring detailed responses) were ordered first. Others were arranged alphabetically.

Following Table 2-1, the comments and responses are presented. The Hearing Report and all letters have been reproduced in their entirety. Several form letters were submitted by individuals. Only one copy of each of these letters has been reprinted, and all of the individuals who submitted copies of the letter are listed on Table 2-1.

The substantive comments contained in each letter and the Hearing Report have been identified with a bracket and reference number keyed to the letter/hearing number from Table 2-1. Thus, Comment 3-4 refers to the fourth comment in Letter #3. Responses to comments are printed on the right-hand side of the page accompanying the comment text, and are labeled according to the comment number. Thus, the response to Comment 3-4 is labeled Response 3-4.

Table II-1

Public Hearing and Comment Letters

[illegible]	[illegible]
Public Hearing	
1	Ray Lazuk - Golden Sunlight Mines, Inc. Jerry Harrington - Golden Sunlight Mines, Inc. Ed Bartlett - Montana Power Mark Gornick Calvin Johnson Bob Sims Jill Andrews - Montana Mining Association Paul Seccomb Leonard Dusck Stuart Fuller Tammy Johnson - CURE Robin McCulloch - Montana Bureau of Mines and Geology K.D. Feeback Rick Dale Nondy Mason George Holcomb Tom Tangen - McDonald Gold Trenton Jones Haley Beaudry - Montana House of Representatives Evan Barrett - Butte Local Development Corporation Martin Johnson Glenna Obie - Chair of Jefferson County Commission Cindy Fisk Leonard Wortman - Jefferson County Commissioner Sam Samson - Jefferson County Commissioner Duane Grimes - Montana House of Represenatives Emlyn Neuman-Javornik - Jefferson County Economic Development Task Force Tad Dale
Federal Agencies	
2	John Wardell, Cynthia Cody - U.S. Environmental Protection Agency Region VIII
State Agencies	
3	David Owen - Montana Chamber of Commerce
4	Dr. Christopher H. Gammons - Montana Tech of the University of Montana
County Agencies	
5	Bonnie Ramey, Glenna Obie, Leonard Wortman, Sam Samson - Jefferson County Commission
6	Emlyn-Neuman-Javornik, Scott Mendenhall - Madison-Jefferson County Extension Office

Table 8-1 (Continued)

[illegible]	[illegible]
Local Agencies	
7	Ed Orizotti, Connie Kenney - Butte Chamber of Commerce
Elected Officials	
8	Senator Norris "Mack" Cole - Montana State Senate
9	Senator Mike Foster - Montana State Senate
10	Senator Chuck Swysgood - Montana State Senate
11	Representative Duane Grimes - Montana House of Representatives
12	Representative Larry Grinde - Montana House of Representatives
13	Representative Scott J. Orr - Montana House of Representatives
14	Representatives Joe Quilici, Dan Harrington, Red Menahan, Bob Pavlovich, and Haley Beaudry - Montana House of Representatives; and Senators J. D. Lynch, Bea McCarthy, and Debbie Shea - Montana State Senate
15	Jack Lynch, Chief Executive - City and County of Butte-Silver Bow
Organizations	
16	Gallatin Wildlife Association, Mineral Policy Center, Montana Environmental Information Center, National Wildlife Federation, and Sierra Club (letter prepared by James R. Kuipers, P.E. of J. Kuipers Engineering)
16A	Gallatin Wildlife Association, Mineral Policy Center, Montana Environmental Information Center, National Wildlife Federation, and Sierra Club (letter prepared by Thomas M. France, Esq. of National Wildlife Federation)
17	Tamara J. Johnson - CURE
18	Jim Keane - International Union of Operating Engineers
19	Mike Foster - Montana Contractors' Association Inc.
20	Jill Andrews - Montana Mining Association
21	Gail Abercrombie - Montana Petroleum Association
22	Don Allen - Western Environmental Trade Association
Industries/Businesses	
23	Raymond Lazuk - Golden Sunlight Mines, Inc.
24	Jerry Harrington - Golden Sunlight Mines, Inc.
25	Robert S. Mackey - Anaconda Foundry Fabrication Company, Inc. (AFFCO)
26	Ronald A. Tuchimas - Anaconda Foundry Fabrication Company, Inc. (AFFCO)
27	Sandra M. Stash, P.E. - ARCO Environmental Remediation L.L.C.
28	John R. Shaw - ASARCO

Table 5-1 (Continued)

29	David K. Young - ASARCO
30	John C. Parks - Barretts Minerals Technologies
31	David M. Moody - Big Iron Equipment & Repair
32	Michael Jagoe - Boart Longyear Company; Max Kingsley - Boart Longyear Company; Tony Hass - Northwest Drilling
33	Kipp R. Huckaba - Cardwell Store & RV Park
34	Stewart Holzworth - Dickinson Equipment Co., Inc.
35	Joseph W. Hajny - Dyno Nobel Intermountain, Inc.
36	Roger V. Green - Eastern Electric Apparatus Repair Company, Inc.
37	John Standish - Energy Laboratories, Inc.
38	Lawrence E. Fickler - Fickler Oil Company, Inc.
39	John W. Gabelman, Olive T. Gabelman - John W. Gabelman & Associates, Inc.
40	Joan Gabelman - Golden Sunlight Mines, Inc.
41	L. R. Huckaba - L. R. Huckaba Ranch, Inc.
42	Corey Meier - Koocanusa Land Use Planning and Design, Inc.
43	Sue DeVries - Liberty Pipe Company
44	William M. Snoddy - McDonald Gold Project
45	Roger W. Webb - Midland Implement Company Incorporated
46	Pamela S. Backstrom - Minex
47	John V. Burk - Montana Resources
48	Bob Chamberlin - O'Keefe Drilling
49	Phillip J. Hurd - Parts & Rigging Co., Inc.
50	Bill Payne - Payne Machinery, Inc.
51	Kevin J. Ryan - Pegasus Gold Zortman Mining, Inc.
52	David B. Rovig - Rovig Minerals, Inc.
53	Dale E. Scholz - Dale L. Scholz, Inc.
54	Gary Loghry - T-G's IGA
55	Victor Lazar - The Industrial Company Wyoming, Inc.
56	The employees of - Tractor & Equipment Co.
57	The employees of - Tractor & Equipment Co.
58	Dennis Campbell - Carl Weissman & Sons, Inc.

Table 5-1 (Continued)

59	Gayle Sacry, M.D. - Whitehall Medical Clinic
Individuals	
60	Gail B. Amicucci
61	Marilyn J. Bartlett
62	Dana Bauer
63	Dana Bauer
64	Tamara Bellon
65	Tana L. Boldt
66	Greg Briggs
67	Mark Briggs
68	Ken Bright
69	Shane Brockman
70	Paul Buckley
71	Richard & Karen Choquette
72	Paul Dale
73	Rhonda Dale
74	Richard T. Dale
75	Dennis R. Davis
76	Joseph M. Dillon
77	Pat Dolan
78	Don Drake
79	Devin R. Drayton
80	Leonard Dusck
81	Leonard Dusck
82	Ralph J. Duhame
83	William Enriquez
84	Dale Eustice
85	K. D. Feeback
86	William G. Faust
87	Cindy Fisk
88	Martin Foote, Ph.D.

Table II-1 (Continued)

[illegible]	[illegible]
89	Carolyn M. Good
90	Mark Gornick
91	Mark Gornick
92	Marc E. Groy
93	Judy Hall
94	Mark A. Hall
95	Jerry D. Hanley
96	Donna L. Heikkinen
97	Mark Hoard
98	Mark Hoard
99	Clifford Hoopes
100	Lance Huguiet
101	William L. Huguiet
102	Cyrena Janacaro
103	Eric Janacaro
104	Jeff Janacaro
105	Calvin Johnson
106	Calvin Johnson
107	Larry M. Johnson
108	Martin L. Johnson
109	Michelle Johnson
110	Joan M. Jones
111	Trenton Jones
112	Rick S. Jordan
113	Jim Keane
114	William P. Klein, Jr.
115	Mark Konen
116	Shera Konen
117	Andy Lande
118	Benjamin Lande
119	Lynn A. Lande

Table II-1 (Continued)

Public Hearing or Letter Number	
120	Brian Lankford
121	Thomas M. Malloy
122	James R. March
123	Robert L. Marks
124	Bret Martinell
125	Jay McClosky
126	Wade E. McCord
127	Steve McDonnell
128	Noelle L. Meier
129	Rick Moeykens
130	Chris M. Nelson
131	Jeanne Nelson
132	Robert Nevin
133	Joe Newman
134	Joe Nicholls
135	Marie Olson
136	Tom Palakovich
137	Douglas C. Parker
138	Diana Parks
139	Richard A. Parks
140	John Patritti
141	Henry E. Reed
142	Tory Rice
143	Chris D. Richardson
144	Ron Richardson
145	Marie F. Risher
146	Richard Roberts
147	Tom Ruark
148	Ed Ruckdaschel
149	Kay A. Ruckdaschel
150	Edward T. Ruppel

Table II-1 (Continued)

[illegible]	
151	Darrell Scharf
152	Paul Seccomb
153	Paul Seccomb
154	Rickey R. Sharkey
155	Charlene Sholey
156	Earl Sholey, Jr.
157	Frank Sholey
158	Larry D. Smith
159	Olive L. Smith
160	Paul Smith
161	Richard A. Smith
162	Ilen E. Stoll
163	John W. Stratton
164	Bob Sanderland
165	John J. Tomich
166	Travis J. Traub
167	Miles & Doloris Tuttle
168	Sharel Uphus
169	Dan L. Walker
170	Lanny Weldman
171	Lamoin Weldman
172	Kerry Weightman
173	Marcus Williams
174	Doug Young
175	Larry G. Young
176	Mark Zalur

Table II-1 (Continued)

Public Hearing or Letter Number	
Form Letters	
177	Michael W. Madden, Everett K. Adams, James A. Anderson, Norris C. Anderson, D. M. Bisch, Herb L. Burton, Brad E. Clemons, Henry D. Cobben, Garry Costle, Thomas E. Finn, Alvin A. Fode, Lawrence G. Hardtle, Paul S. Hesphy, David J. Hebert, Michael G. Hebert, Jeffrey E. Hempsted, Charles F. Hickman, Paul R. Jessen, Gerald R. Johnston, William T. Kaufman, Kenneth D. Keller, Walter T. Kloker, Delbert D. Langer, Craig Lodell, Floyd T. Miller, Phillip A. Nebeker, Shawn P. Odden, Ronald G. Peterson, Joseph S. Podabnick, Janice E. Prinkki, Rodd O. Proctor, Daniel S. Ricketts, Kenneth A. Rudd, Tony A. Salle, Ray L. Sandlin, Keith Smith, Wayne E. Smith, Bruce M. Stradwick, Cody D. Swainston, Donald B. Swanson, Ramona L. Vauthier, Cory J. Vollmer, Joseph M. Weist, Dan J. Wyant, Delbert W. Wyant, Kris J. Zanni
178	Edna Lutey, Jack F. Ballard, Magdalena Bieber, James J. Brennan, June Capps, Mary Ann Clarke, Darryl Cogdill, Sr., Marion Cogdill, Beth Frazier, Richard J. Gurtz, Mary E. Gustin, Harold Guthrie, Hazel D. Guthrie, Mike Hickey (Tractor & Equipment Co.), Carolyn A. Hotrum, Cyrus Hotrum, Trenton Jones, Joe C. Kenubrthy, Clarence Keogh, Forrest Landon (Tractor & Equipment Co.), Frances Lemar, Hillis Lapp, Jack Mercer (Tractor & Equipment Co.), Tom Naegele, Marian Poff, Gladys Pounds, Natalene Redinsick, Mildred Roberts, Roger Rohr (Tractor & Equipment Co.), Nick Schneider (Tractor & Equipment Co.), Marilyn J. Scholl, Mary E. Segraves, Louis Swearingen, Corinne D. Tripp, Mabel Webster, Jacqueline Wiedenmeyer, Elva Wilkinson
179	Denise Gleich, James J. Alley, Bernadette Connor, Bruce G. Denny, Scott Gleich, John Hawks, Laura Haxby, Regina Kamps, Carrin Layne, Darryl Layne, Joanne Layne, Neal Layne, Amber L. Mabbot, Sherrie Mihelich, Rodney Mills, Melissa S. Olsen, Diana Parks, Dan & Sarah Reum, June Severance, Deanna M. Wall, J. Mike Wall, Shaun Wall
180	Tim Hockenberry, Mark J. Gnerer, Benjamin Scholz
181	Carol Cocking, Ed Simon, T. C. - Truly Professional Janitorial
182	Jim Loomis, Edward G. Barry
183	(unreadable), Richard V. Capp

Letter 1

Hearing Report

The public meeting held in Whitehall High School on January 5, 1998 had approximately 100 attendees. Twenty-eight of the attendees presented statements. All spoke in support of the Golden Sunlight Mine Project. Several speakers also submitted statements in writing. The key points from each statement are presented below.

1) Ray Lazuk - GSM Environmental Manager

1-1
- The DEIS is technically sound and thorough.
- The mitigation for bird nesting habitat (Measure WF-4) is excessive; it would prevent soil stripping and suspend operations. GSM has already mitigated off-site and has committed to restoration, This information needs to be disclosed in the EIS.
- Drains on the edges of the dumps to prevent infiltration is unrealistic. The amount of water is minimal. Appendix A is adequate to address these concerns.
- The Partial Backfill Alternative does not meet the intent of the MMRA. This should be further explained in the EIS.

2) Jerry Harrington - GSM General Manager

1-2
- The DEIS is thorough and rigorous in its analysis and the stipulations have been met.
- The schedule delays have been extremely excessive and have had a considerable direct effect on GSM's mining costs and capital budget, forcing changes in mine engineering, etc. This has caused one-sided detrimental impacts.
- In the pit reclamation feasibility discussion, the Partial Backfill Alternative should be further explained. The discussion should mention the other criteria in the MMRA other than economic feasibility, such as environmental benefits and unidentified reserves (400,000 ounces not recovered). The MMRA discourages preventing access to future mineral resources. The Partial Backfill Alternative doesn't meet the intent of the MMRA.

3) Ed Bartlett - Montana Power, Manager of Government Relations

1-3
- In support of continued operation of GSM. The Draft EIS is adequate.
- Process - time for completion.
- GSM has a history of acting responsibly.
- The Proposed Action or Preferred Alternative are acceptable. The Partial Backfill Alternative is not necessary.

4) Mark Gornick - GSM employee

Response to Letter 1

1-1 Comments also were submitted in writing. See Responses for Comment Letter 23.

1-2 Comments also were submitted in writing. See Responses for Comment Letter 24.

1-3 Thank you for your comment. No response necessary.

Letter 1 Continued

1-4
- In support of the mine.
- The Partial Backfill Alternative is not necessary or feasible; this should be explained better in the EIS. Further discussion of the MMRA is needed, as this alternative does not meet the requirements of the Act.

5) Calvin Johnson - GSM employee

1-5
- In support of the mine. He may lose his job if the EIS is not completed in a timely fashion.
- Page 100 to 114 of the summary: the Partial Backfill Alternative has very few benefits at an enormous cost to the mine. The off-site mitigation more than makes up for the reclaimed pit.
- The page number on 113 is missing.

6) Bob Sims - rancher

1-6
- We are adding burdens to a mine that's doing a good job. This might tip the balance towards people that are not as environmentally responsible. More environmental requirements imposed on GSM will force production to another location with less care for the environment. The EIS should have a study showing this effect.

7) Jill Andrews - Montana Mining Association, Executive Director

1-7
- In support of GSM's operating permit. The DEIS is adequate and fair in its analysis.
- The mixing zone and water resource management plan will provide adequate protection for water quality.
- The mine provides beneficial socioeconomic impacts for the community. The economy is dependent on the mine.
- The mine is environmentally responsible.

8) Paul Seccomb - GSM employee

1-8
- Water quality is an important issue. GSM has been responsible in dealing with this issue and has posted a bond.
- Partial Backfill Alternative: mandatory backfilling is not required by the state - this was not the intent of the state. On page 297 of the EIS it states that the impacts would be similar to the Proposed Action. The summary should include this, as should the Agency Preferred Alternative discussion. The summary does not state that backfilling will improve water quality, so where is the rationale for it?

9) Leonard Dusek - GSM employee

Response to Letter 1

1-4 Comments were also submitted in writing. See Responses for Comment Letter 91.

1-5 Comments were also submitted in writing. See Responses for Comment Letter 108.

1-6 Comment noted. The type of study suggested is beyond the scope of the EIS.

1-7 Thank you for your comment. No response necessary.

1-8 Comments were also submitted in writing. See Responses for Comment Letter 153.

Letter 1 Continued

1-9
- In support of the mine
- Page 27 and 28 of the Summary: The economic concerns of partial backfilling are not the only issues that should be described in the Summary. No added protection would result from the Partial Backfill Alternative. This should be pulled forward. Also, it should talk about the potential for the mine to shut down if this alternative is selected.

10) Stuart Fuller

1-10
- The EIS is adequate.
- The Partial Backfill and other alternatives are essentially No Action alternatives. The Purpose and Need for other alternatives should be described.
- Mitigation Measure WF-4 to protect nesting birds is excessive and not practical. GSM has already taken mitigation steps.

11) Tommy Johnson - CURE

1-11
- In support of GSM's Proposed Action and Preferred Alternative that includes the No Pit Pond Alternative.
- Mining is necessary and Golden Sunlight is a good place for it. They are good stewards of the land.
- Pit backfilling is not acceptable.
- The way the document is written is too difficult for most people to read. We should put pertinent information in the summary (such as the reasons for not backfilling) because that's what most people will read.

12) Robin McCulloch - Montana Bureau of Mines and Geology

1-12
- In support of Proposed Action
- The cost to the mine is not an adequate reason for not backfilling. With backfilling, future mining potential would be foregone. This is short-sighted. This provides a significant economic reason to not backfill.
- Mitigation Measure WF-4 is not good. It encourages pre-stripping the area so the nests are not there. This would contribute to erosion.
- The process has been too lengthy. We need to complete the EIS so it does not become a burden on the taxpayers of the county.

13) K.D. Feeback

1-13
- Supports mining for economic benefits. Governments receive economic aid from mines.
- GSM's proposal is sound.
- Wildlife issues have been dealt with effectively. GSM is a good citizen and neighbor.

Response to Letter 1

1-9 Comments were also submitted in writing. See Responses for Comment Letter 81.

1-10 Comment noted. The rationale for each alternative is described in Chapter II of the Draft EIS. Please see the Responses to Comments 16-27 and 23-5 regarding partial backfilling. Please see the Response to Comment 23-2 regarding Mitigation Measure WF-4.

1-11 Comments were also submitted in writing. See Responses for Comment Letter 17.

1-12 Comment noted. Please see the Response to Comment 23-5 regarding partial backfilling. Please see the Response to Comment 23-2 regarding Mitigation Measure WF-4.

1-13 Thank you for your comment. No response necessary.

Letter 1 Continued

1-13
- They have enhanced recreation and open space in addition to wildlife. GSM is environmentally conscious.
- Delays are unconscionable. Expedite the Final EIS. The EIS is thorough and technically superior in its analysis.

14) Rick Dale - GSM employee

1-14
- In his 25 years of experience in the mining industry, he believes that GSM mines with the highest of standards.
- He is in support of the mine. The good workers at GSM will uphold the standards imposed.

15) Randy Mason

1-15
- GSM has done good things for the community and the environment and has tried to correct problems.
- Preserve jobs in the area.
- Permit the mine with no further delays.
- We must be environmentally concerned, but the controls have gone too far. We need to find a balance.

16) George Holcomb - miner

1-16
- Montana takes 2 to 5 years longer to give permits than anywhere else. (He has worked in Colorado, Chile, and other places.)
- In support of the mine.
- Documents and technical analysis don't mean anything. A quality workforce, management, and company are the only things that matter. GSM has proved they have this.

17) Tom Tongen - McDonald Gold

1-17
- In support of mine. They have a quality company and personnel.
- The mine provides jobs and tax base benefits.
- Don't delay the mine anymore. Approve the mine and let them get going.

18) Trenton Jones - GSM employee

1-18
- In support of mine.
- Uncertainty about employment. If the permit is not issued soon, they will lose jobs.
- Backfilling isn't feasible for open pit mines.

Response to Letter 1

1-14 Thank you for your comment. No response necessary.

1-15 Thank you for your comment. No response necessary.

1-16 Thank you for your comment. No response necessary.

1-17 Thank you for your comment. No response necessary.

1-18 Comments were also submitted in writing. See Responses for Comment Letter 111.

Letter 1 Continued

1-18
- Partial backfilling has safety issues for workers. This should be included in the summary. The environmental benefits are minimal.

19) Haley Beaudry - Representative to House District 35 in the State Legislature

1-19
- Feasibility of partial backfilling: if it is not economically feasible, then it is not feasible, period (even if technically feasible).
- Partial backfilling would cause the loss of 400,000 ounces of reserves, and $80 million would not be spent. It would close a valuable mine.
- GSM is a good neighbor and provides many economic benefits to communities: jobs, payroll, taxes, schools.
- In support of mine.

20) Evan Barrett - Butte Local Development Corporation

1-20
- They are concerned with the economy of the region. They have a great interest in the mine. 55 workers live in Butte. The quality of jobs is important. The per capita income in Montana is 48th in the U.S. GSM provides good quality high-wage jobs. Jobs have been lost in Anaconda-Butte. GSM getting its permit is very important for the economy of the region.
- If partial backfilling is economically infeasible, then it is essentially telling them they can't mine, and the alternative should be dismissed.
- The Partial Backfill Alternative violates 3 objectives of the MEPA.
- The mine permit has been delayed too long.
- The people suing just want to shut the mine down. The mine is within the law.

21) Martin Johnson - GSM employee (founder of CURE)

1-21
- In support of mine.
- The mine complies with the law.
- The pit backfilling rationale should be explained better in the summary. It should be stated that they have already complied with the law and don't need backfilling. The discussion of economics is O.K., but other reasons are not stated; economics should be the last item. Since most people just read the summary, this needs to be more clear.
- Complete the document as quickly as possible.

22) Glenna Obie - Chair of Jefferson County Commission

1-22
- In support of mine. The EIS is adequate.
- There are no mitigations proposed for the social and [illegible] impacts of not mining.
- Urges the process to continue post-haste.

Response to Letter 1

1-19 Comment noted. Please see the Responses to Comments 16-37 and 23-5.

1-20 Comment noted. Please see the Responses to Comments 16-37 and 23-5.

1-21 Comments were also submitted in writing. See Responses for Comment Letter 108.

1-22 Comment noted. The social and economic impacts of discontinued mining are described in Section IV.J.1 of the Draft EIS. Suggesting mitigation measures for these impacts is beyond the scope of the EIS.

Letter 1 Continued

1-22
- The commission will draft a letter in support.

23) Cindy Fisk - GSM employee

1-23
- In support of mine. GSM is good steward of the land.

24) Leonard Wortman - Jefferson County Commissioner

1-24
- In support of mine.
- Need to speed up process.

25) Sam Samson - Jefferson County Commissioner

1-25
- In support of mine.

26) Duane Grimes - Representative of District

1-26
- He carried the legislation of the MMRA. He hopes that it can be amended to be more Montana-friendly.
- The DEIS is balanced.

27) Emlyn Neuman-Javornik - Chair of Economic Development Task Force of Jefferson County

1-27
- In support of mine.
- DEIS addresses concerns.
- Accept document and Preferred Alternative.

28) Tad Dale - small miner

1-28
- In support of mine.
- Small operators are affected by what happens to the large operators. Small miners will suffer also.
- Protect jobs.
- Process should be completed.

Response to Letter 1

1-23 Thank you for your comment. No response necessary.

1-24 Thank you for your comment. No response necessary.

1-25 Thank you for your comment. No response necessary.

1-26 Thank you for your comment. No response necessary.

1-27 Thank you for your comment. No response necessary.

1-28 Thank you for your comment. No response necessary.

Letter 2

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VIII
999 18th STREET - SUITE 500
DENVER, COLORADO 80202-2466

JAN 21 1998

Ref: 8EPR-EP

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JAN 27 1998
MT. DEPT OF ENV QUALITY
PERMITTING & COMPLIANCE DIV

David Williams
Bureau of Land Management
Butte District Office
106 S. Parkmont, Box 3388
Butte, Montana 59702

Greg Hallsten
Montana Department of Environmental Quality
1520 East 6th Avenue
P.O. Box 200901
Helena, Montana 59620-2301

Re: EPA Region 8 Review of Draft EIS; Golden Sunlight Mine Expansion, Jefferson County, Montana; Rating EC-2

Dear Mr. Williams and Mr. Hallsten:

Thank you for the opportunity to review and comment on the Draft Environmental Impact Statement (DEIS) for the proposed expansion of the Golden Sunlight Mine. EPA previously provided comments on the December 1996 Preliminary Draft EIS and, following a site visit and meetings between the staffs of EPA and the lead agencies, reviewed the third preliminary Draft EIS of June 1997. EPA has some remaining environmental concerns with the proposed action and believes that some additional information can be provided in response to these comments in the upcoming Final EIS.

Our key recommendations include the need to calculate the final bonding amount to maintain compliance with water quality standards in perpetuity and the need to improve upon the ground water mixing zone procedure. We believe these particular efforts can be accomplished after the Final EIS is completed provided these matters are sufficiently recognized as commitments in the Record of Decision.

EPA's review of the Draft EIS is pursuant to its authority under Section 309 of the Clean Air Act, under which EPA is to review and comment upon environmental impact statements; Section 404 of the Clean Water Act, under which EPA has oversight concerning dredge and fill permits issued by the United States Army Corps of Engineers; and Section 402 of the Clean Water Act, under which EPA has oversight concerning Montana's administration of the EPA-approved Montana Pollutant Discharge Elimination System (MPDES) program.

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Response to Letter 2

Letter 2 Continued

2-1 We compliment your staff for the preparation of the Draft EIS. The DEIS realistically explains why perpetual water treatment is essential. It provides credible information on the cost of the collection and treatment, and for the bond conditions that could be used to assure adequate funds to ensure post-closure water quality treatment. The information in Appendix A on long-term water management at the site is well written, detailed and clear about adverse water quality expected from the site which is to be treated and discharged.

2-2 Ray Lazuk of GSM suggested to our staff that it may be useful for EPA to participate in the upcoming bonding procedure by the lead agencies. We would like to offer the services of our staff to work on the financial assurance criteria. This work should be pursued with a goal of obtaining bonding or other appropriate financial instrument that will assure that the full cost of feasible controls will be obtained to maintain compliance with the established water quality standards; including maintenance, infrastructure costs, replacement, and contingencies. Please advise as to the timing of this activity and the need for our staff assistance.

2-3 The selection of the Return Diversion Alternative as the preferred alternative for the East Waste Rock dump expansion was thoughtfully considered. The Return Diversion Alternative, involving diversion of Sheep Rock Creek flows around the expanded East Waste Rock dump, is preferable to diverting Sheep Rock Creek flows into the Cannon Creek, and ultimately, the Boulder River drainage. The Return Diversion Alternative also effectively consolidates potential acid rock drainage (ARD) producing waste rock in areas having greater acid neutralization potential.

2-4 We note that it may be necessary to utilize aquatic life criteria in addition to drinking water criteria for certain expected mine water discharges. For example, Table IV-3 would indicate that Montana Water Quality Standards for aquatic life criteria for surface waters are much more stringent for cadmium (e.g., 0.011 mg/l at 100 mg/l hardness), copper (e.g., 0.012 mg/l) and zinc (e.g., 0.11 mg/l) than the values included for "Montana Standards" in Table IV-3 (which are drinking water standards). If degraded waste rock dump ARD waters surfaced or discharged to surface waters, the surface waters would need to meet the more stringent aquatic life water quality standards for these metals. We note that mitigation measure W-5 (page 379) suggests that water treatment plant effluent may be discharged to surface waters, in which case compliance with the aquatic life criteria for metals in those surface waters would be needed.

2-5 EPA concurs with installing drains between the edges of the existing waste rock dumps before final contouring and reclamation to reduce the amount of ARD seepage reaching groundwater (see page 113). 2-6 While EPA also concurs with installing engineered limestone drains in Sheep Rock Creek and other intermittent and ephemeral drainages to collect and channel seepage from the expanded East Waste Rock Dump, we note that the limestone will rapidly armor with iron and reduce the expected treatment objective. (See pages 113 and 378). 2-7 As noted in the DEIS, given the acid characterization of the waste rock, the pit, and the tailings, it is probable that water seeping from these areas will be contaminated with acid and/or toxic metals. We believe the design of the groundwater capture system for the waste rock dumps

Response to Letter 2

2-1 Comment noted.

2-2 Under the Montana Metal Mine Reclamation Act (MMRA), MDEQ is required to calculate and hold a reclamation bond for exploration, small miner, and operating permits. In the past when working with other state or federal agencies as either co-permitting or co-operating agencies, the responsibility of calculating the bond has fallen on MDEQ. This situation should be no different. These other agencies have involved themselves to varying degrees in the calculation and review process. MDEQ has always welcomed and valued this input and looks forward to working with the agencies on the reclamation bond. Bond calculations will be attached to the Record of Decision.

2-3 Comment noted.

2-4 Aquatic life criteria would apply to surface water discharges, not groundwater impacts. Table IV-3 provides estimates of existing and future metals concentrations in groundwater. The comparisons on Table IV-3 between groundwater quality and Human Health Standards provided by Circular WQB-7 are therefore appropriate. The Water Management Plan (Appendix A) and the Mixing Zone Application (Appendix B) indicate there will be no discharge to surface water. ARD-impacted water collected from the pit, from groundwater capture and pumpback systems, and any surface seepage from the waste rock dumps would be collected and conveyed to the water treatment plant. GSM would most likely discharge treatment plant effluent to one or more percolation ponds that ultimately recharge the underlying groundwater system.

Implementation of Mitigation Measures W-1 and W-6 could result in surface water discharge within the boundaries of the mixing zone. These measures are designed to mitigate impacts to beneficial uses caused by groundwater capture and water table drawdown in the vicinity of the waste rock dumps. The only surface waters that might receive treatment plant discharge are springs or ephemeral drainage channels. The ephemeral drainage channels naturally function as sources of groundwater recharge by allowing storm water runoff to infiltrate quickly into the bottom of the drainage channel. Discharging to these features would be similar to discharging to percolation ponds.

Montana regulations clearly prohibit any discharge that exceeds ambient water quality without MDEQ approval. A discharge may exceed standards within a mixing zone but may not exceed standards beyond a mixing zone unless the ambient water quality already exceeds standards naturally. Many of the springs and ephemeral drainages in the vicinity of GSM already exceed aquatic life criteria because these areas are naturally mineralized. There would be no need to impose aquatic life criteria on treatment plant effluent unless it was clear that the discharge would violate these regulations.

Response to Letter 2

2-5 Further review suggests that placing drains under the edges of the waste rock dumps would be unlikely to reduce the amount of ARD seepage reaching the groundwater. The primary purpose for installing shallow drains around the downgradient peripheries of the waste rock dumps is to provide a means of intercepting ARD-impacted groundwater leaving the dumps via shallow, discrete preferential flow paths ("perched" flows) that would bypass the primary, deep groundwater capture well system. Perched groundwater flow, if it occurs, would likely appear in the relatively pervious alluvial/colluvial materials that are contained in the naturally incised, existing drainage features. Perched flows can be effectively captured with trench drains installed within the evident drainages downgradient from waste rock dumps. Shallow groundwater capture wells would be installed as an alternative to trench drains for the larger, deeper drainages such as Sheep Rock Gulch and the Rattlesnake drainage downgradient of the East Waste Rock Dump.

Implementation of toe drains or shallow capture wells would be done as needed based on monitoring. Instead of requiring GSM to install drains under the edges of the waste rock dumps, the agencies will require the construction of shallow monitoring wells in all topographically evident drainages downgradient of the waste rock dumps. If adverse water quality impacts are detected, trench drains or shallow capture wells will be installed in the affected drainage(s). To ensure that all impacted water is captured, trench drains in the West Waste Rock Dump area will extend to bedrock, and trench drains or capture wells in the East Waste Rock Dump area will be completed through the alluvial/colluvial materials to the underlying Bozeman sediments. Captured water will be conveyed by gravity-flow pipelines to the water treatment plant or collected in a centralized sump and pumped to the treatment plant. Mitigation Measure W-4(b) has been modified to include these implementation and design requirements for shallow groundwater capture systems.

2-6 This measure is no longer included in the Select Mitigation Measures identified for the Preferred Alternative (see Summary, page xxvi). The use of limestone in the toe drains was presented as Mitigation Measure W-4(c), page 378, to add the benefit of acid neutralization. This concept was proposed as a passive *in situ* treatment alternative to possibly alleviate the need to collect, convey, and treat shallow groundwater seeps. The issue of iron armoring of the limerock, and reduced effectiveness of the passive treatment system over time is recognized. This mitigation measure would require maintenance such as periodic excavation and replacement of the limerock reaction walls. This required maintenance makes this alternative mitigation measure less desirable in comparison with permanent installations (toe drains or wells) that collect, convey, and treat shallow ARD-impacted groundwater seeps.

Should material need to be placed in a drainage bottom or anywhere it could come in contact with water, non-acid generating materials would be used. While limestone drains for passive treatment have a demonstrated effectiveness over a limited time period, MDEQ and BLM do not view them as the sole treatment mechanism nor as a long-term solution for the reasons noted in the comment.

Response to Letter 2

2-7 The tailing impoundment capture systems are in place. Preliminary designs for the pit dewatering system and a groundwater capture system for the waste rock dumps have been prepared. Analysis indicates that these designs will be adequate to handle anticipated groundwater flows. It would not be possible to provide more than a schematic design for groundwater capture systems downgradient of the west and east waste rock areas at this time. Additional monitoring of groundwater quantity and quality throughout the rest of mine life, and further hydrogeologic studies to determine preferential flow paths, will help to refine these designs. The agencies will require GSM to prepare detailed designs, based on existing and new information, for agency review and approval before mine closure.

Letter 2 Continued

2-7 (including the East Waste Rock Dump), the pit, and the tailings impoundments should be prepared and presented in detail as part of the operating permit. It is vitally important that the

2-8 the Final EIS and Record of Decision describe a regulatory procedure to ensure that GSM will design and build these capture systems effectively, and, above all, ensure continued compliance with water quality standards.

2-9 Implementation of mitigation measures W-1, W-4, W-5, W-6, W-8, W-9 and W-10 is essential to adequately prevent or mitigate contamination of ground water in the vicinity of the mine. EPA recommends that MDEQ require that these mitigation measures be implemented by GSM to ensure compliance with Montana Groundwater Quality Standards (ARM 16.20.1011), Nondegradation of Water Quality requirements (ARM 16.20.701) and Mixing Zones in Groundwater rules (ARM 16.20). EPA staff is willing to assist with this effort as part of the

2-10 lead agencies preparation of the Record of Decision and subsequent operating permits.

2-11 The recent precipitous drop in the market value of gold could affect environmental compliance at this facility. This week Pegasus Gold Inc. filed for bankruptcy as a result of the record low gold prices. Information in the Draft EIS indicates that GSM must sustain a gold price of $350 to $400 per ounce (from 1997 through 2005) for a positive rate of return to be realized under the Proposed Action. The substantially lower gold price raises a concern about the financial ability of GSM to be able to implement the environmental mitigation measures that will be required for implementation of the preferred alternative. We believe the Final EIS should address the potential effect of these record low gold prices and the manner in which the company would respond that might significantly affect the proposed water management, water treatment, and/or mine operations, processing or reclamation. In particular, it should address how any potential measures to reduce operating costs prompted by the reduced price of gold would modify either the current projections of environmental impacts or proposed measures to mitigate environmental impacts.

Based on the procedures EPA uses to rate the adequacy of a draft environmental impact statement, the Draft EIS for the Expansion of the Golden Sunlight Mine will be listed in the Federal Register in Category EC-2. This means that EPA has some remaining concerns about the environmental impact of the proposed action, and that additional information is needed in the Final EIS as suggested above and as noted in the attached detailed comments. Please contact Weston Wilson or Dave Pete of our staff at (303) 312-6562 and (406) 441-1140 ext. 232, respectively, if we can further explain these concerns and possible responses to them.

Sincerely,

Cynthia Cody, Chief
NEPA Unit
EPA Region VIII

John Wardell, Director
Montana Operations Office
EPA Region VIII

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Response to Letter 2

2-8 Montana water quality regulations and the Montana Metal Mine Reclamation Act provide the regulatory procedure to ensure that the water management systems will be implemented and GSM will comply with water quality standards. Any mitigation measures described in the Final EIS and stipulated to the operating permit through the Record of Decision will be legally enforceable within the agencies' regulatory powers. Compliance with water quality standards will be enforced by the agencies. The reclamation bond is the principle financial tool to ensure the systems will be constructed. The reclamation bond will be revised as needed following the permit decision as new information is obtained regarding groundwater conditions and potential sources of discharge.

2-9 The Record of Decision will stipulate any mitigation measures needed to ensure that GSM complies with water quality laws. The mitigation measures mentioned by the commentor will certainly be considered by the agencies. The spring monitoring suggested in Mitigation Measure W-1 has been in effect since 1984, when GSM began monthly monitoring of all springs on site for selected field parameters including flow, pH and SC. The capture wells recommended in Mitigation Measure W-6 were installed in 1983, when GSM constructed a series of wells below Impoundment No. 2 (TSPD wells on Figure A1, Appendix A) as a contingency measure for seepage capture. Four dewatering wells constructed in 1994 in Rattlesnake Gulch above Tailing Impoundment No.1 and the Bulrmas waste rock dump partially fulfill Mitigation Measure W-6. The wells operated intermittently up until late 1997, when GSM constructed a percolation pond to enable more continuous discharge from the wells. Additional mitigation work will be conducted pending the results of long-term pumping from the wells.

2-10 The agencies welcome EPA's assistance with the hydrologic assessment and the groundwater capture system design.

2-11 It is not within the scope of the EIS to evaluate the economic profitability of an applicant's proposed action. A metal mine operating permit contains an operating plan, spill contingency plan, monitoring plan, and a reclamation plan. The EIS evaluates the impacts of the operation under these plans. Compliance with these plans is legally required, and the surety bond guarantees this compliance. If the operator were to fail to comply, MDEQ would revoke the bond and use it to ensure compliance. In the event of a prolonged period of low gold prices, GSM has indicated that it would re-optimize its ultimate pit by designing a smaller, profitable pit, that would require less removal of waste rock. Any revision of current mine plans would need to be approved by the agencies, and all reclamation costs would be included in the surety bond.

Letter 2 Continued

Enclosure: EPA Region VIII Detailed Comments on the DEIS for Golden Sunlight Mine Expansion, dated November 1997, 8 pages

cc: [illegible], EPA, Washington, D.C.
Raymond Lazuk, G.M., Whitehall
Kim Wilson, [illegible], Helena

Response to Letter 2

Letter 2 Continued

Detailed Comments by the
U.S. Environmental Protection Agency Region VIII
on the
Draft EIS, Golden Sunlight Mine Expansion
Jefferson County, Montana
November 1997

Volume I

Pit Dewatering Criteria and Treatment Capacity

2-12 **The DEIS states that pit dewatering for the No Pit Pond Alternative will require perpetual removal of 102 gpm, rather than the 65 gpm for GSM's proposed alternative that is shown in Appendix A (Table 4, page A-16). GSM's proposed alternative described in Appendix A would maintain the post-mining pit water level at 5050 feet elevation, whereas the No Pit Pond alternative described on page 95 of the DEIS would maintain the water level below 4800 feet elevation. This 250 foot difference in pit water level between alternatives probably accounts for the difference in reported pit dewatering flows between the DEIS text and Appendix A. Since the No Pit Pond Alternative (maintaining the pit water level at 4800 feet elevation) is the preferred alternative, we recommend that Appendix A (e.g., Table 4, page A-16; Table 2-1, page A-34) be updated to include the 102 gpm pit dewatering flow expected for the No Pit Pond Alternative. Therefore, water management and treatment costs should be also be updated for the larger hydraulic capacity needed for the No Pit Pond alternative.**

2-13 **Also, a 20% contingency flow was included in the 65 gpm pit dewatering flow for GSM's proposed alternative for water treatment plant design. Will a similar 20% contingency be added to the 102 gpm pit water flow for the No Pit Pond Alternative? Has this contingency already been included in the 102 gpm? We note that the hydraulic capacity of the treatment plant is stated to be 400 gpm (page A-33). If a 20% contingency was added to the 102 gpm flow it would result in a 122 gpm pit dewatering water treatment plant design flow with contingencies, or an overall 450 gpm water treatment plant design flow for the No Pit Pond Alternative. Therefore, water treatment plant hydraulic capacity may need to be increased to 450 gpm for the No Pit Pond Alternative.** 2-14 **We also note that mitigation measure W-4 (page 379) suggests a 25% additional flow contingency be used for water treatment plant sizing to account for inflow uncertainty.** 2-15 **We also note also that mitigation measure W-2 would need to be modified to reflect the 4800 foot groundwater elevation if the No Pit Pond Alternative is selected.**

Consideration of effects of potential East Waste Rock dump instability

2-16 **The discussion of geologic/geotechnical concerns for slope instability for the East Waste Rock dump (page 243) indicates that slope failure could encroach upon or block the Sheep Rock diversion channel for the Return Diversion Alternative. The north and east slopes of the dump are**

Response to Letter 2

2-12 GSM is presently modifying its proposed treatment plant design to accommodate all potential inflow sources associated with the preferred alternative. Treatment costs also are being modified accordingly. The modified plant design will include the estimated 102 gpm inflow from the No Pit Pond Alternative.

2-13 The estimated 102 gpm flow from the No Pit Pond Alternative does not include the 20 percent contingency. Applying the contingency, pit water flow presented in Table 4 of Appendix A would be 122 gpm, and the total design flow would be 449 gpm. The revised treatment plant hydraulic capacity will be used to update cost estimates for water management and treatment.

2-14 The contingencies suggested in Table 4 of Appendix A provide for approximately 23 percent additional flow for the No Pit Pond Alternative, for a total capacity of 449 gpm. Mitigation Measure W-6 suggests that additional flow capacity of 25 percent be incorporated into final design. This would be a total design capacity of 455 gpm for the preferred alternative with no pit pond. As outlined in Mitigation Measure W-6, the capacity of the permanent water treatment plant would be reevaluated and incorporated into the final design within 2 years prior to mine closure.

2-15 This mitigation measure doesn't apply to the No Pit Pond Alternative. The groundwater discharge threshold level is constant at 5,050 feet. The No Pit Pond Alternative would maintain a water level below 4,800 feet.

2-16 The foundations for the north and east dumps and dump slopes are on nearly flat bedrock covered with a thin surficial soil. Dump sections in other locations, having the same inclination (2H:1V), greater slope heights, and less favorable foundation conditions were analyzed and were found to be stable with adequate factors of safety. For this reason, the statement in the Draft EIS that the north and east slopes are "expected to be stable" is considered to be technically appropriate.

With regard to the northeast side of the dump in the area where dump slope failure could impact the diversion channel, the maximum reclaimed (2H:1V) dump slope height in this area is approximately 240 ft. The foundation is relatively flat-lying limestone. The foundation geometry is shown on Section A-A' of the 1996 Golder Associates report, Stability Interaction Analysis East Dump Complex. These slope and foundation conditions are very favorable in comparison with other locations that have been analyzed, such as the much higher (>500 ft) western slopes of the West Waste Rock Dump that are founded on unfavorably oriented foundations. The West Waste Rock Dump slopes were found to have adequate factors of safety (1.7 minimum) for slopes inclined at 2H:1V.

Letter 2 Continued

2-16 proposed for reclamation at 2:1, and the south slope at 3:1. The DEIS states that slope failure along the north and east faces of this dump were not analyzed explicitly, and that it is not possible to conclude that factors of safety of the north and east slopes are comparable or better than the south slope which was analyzed. The DEIS goes on to say that despite this uncertainty, based upon analyses of other areas where 2:1 slopes are proposed, the north and east slopes are "expected to be stable." Will site-specific geotechnical analysis be done for all waste rock dump faces as part of the final design?

Due to the potentially significant impacts of East Waste Rock dump slope failure along the Sheep Rock Creek diversion channel (i.e., failure could potentially divert or back up water to contact the waste rock dump, containing acid producing waste rock, and/or erode the toe of the dump potentially increasing opportunities for transport of ARD leachate), are the MDEQ and BLM confident that adequate analyses have been conducted to provide appropriate assurance of low risk of slope failure? What mitigation measures would be implemented in the event that East Waste Rock dump slope failure occurs (encroaching upon or blocking the diversion channel?

Potential effect on operations with lower gold prices

2-17 What are the environmental implications to the Golden Sunlight operation of a prolonged gold price at or below a $280 per ounce level? Specifically, what is the reasonably foreseeable change in mine operations that are likely at the much lower product price? It is noted that GSM's operational costs for vat leach and CIP processing already include slightly over 50% of the total costs. Further, the 1996 GSM production costs (including royalties) indicate a cash cost and a total cost, $228 and $377 per ounce of gold respectively. (Source: The Placer Dome Inc. Golden Sunlight Mine internet site at "http://www.placerdome.com/[illegible].html.") Consistent with this range of costs and confirming this information from Placer Dome Inc, the text indicates that a sustained market price for gold of $350 per ounce of gold would result in a net loss under the Proposed Action. During the week of January 11, 1998 the gold price fell below $280 per ounce.

Managing the groundwater inflow and need for treatment at the Open Pit, Chapters III & IV

2-18 A number of comments are made on pages 141, 145, 146, 147, 155, 157, 248, 255 ,256, 258, 259, that discuss concerns about the water transport of acid rock drainage (ARD), dissolved heavy metals and the relatively low pH of seeps, springs and adit flow in the open pit (and waste rock dumps and in springs and seeps to the southeast of the pit which are addressed in Groundwater Capture Systems in Appendix L). The source of the open pit groundwater is advised to be a "regional groundwater system that flows south, east and west from the hydrologic divide"(page 154). On page 260 the comment is made that "pumping of water from the pit causes a cone of depression in the groundwater table surrounding the pit."

There exists at least one specific example in a surface hard rock mining situation in this country (Berkeley Pit in Montana) where up gradient groundwater source control has controlled the down

55

Response to Letter 2

The stability of the southeast slope of the dump is represented by the analysis of Section NE-5 – NE-5' in the November 15, 1995 Golder report Stability Analysis of East Dump. This section is oriented from the northwest to the southeast. The reclaimed slope geometry has 150-foot high upper and lower slopes inclined at 2H:1V, which are separated by a wide (>1,000-foot) bench. A factor of safety of 1.4 was computed for this slope. Sections on the east side of the dump having similar geometries, but which are oriented in a more east-west direction are expected to have higher factors of safety due to a rising dip of the bedrock surface in an easterly direction.

GSM will be required to submit final waste rock dump designs for agency review and approval at some time before mine closure. Further slope stability analysis, if deemed necessary, will be conducted at that time. Although the likelihood of failure of the eastern and northeastern slopes of the East Waste Rock Dump is low (as described in the Failure Modes and Effects Analysis in Appendix H), such a failure has a level III consequence (i.e., environmental degradation could occur if the situation is not corrected). The compensating measures listed in Appendix H are regular monitoring and maintenance of diversion channels. Implementation of Mitigation Measures G-1 and G-2 would also address potential impacts in this area. The agencies will stipulate in the permit and ROD that protocols will be developed within a specified time period to provide appropriate responses if monitoring detects slope stability problems. Any response would have to be case-specific.

2-17 Please see the Response to Comment 2-11.

2-18 GSM is in the process of evaluating the feasibility of intercepting groundwater upgradient of the open pit to reduce the amount of water requiring treatment. GSM's feasibility evaluation has included fracture/fault identification, test drilling, and aquifer testing. Based on results of this work, GSM constructed two wells on the north highwall that intercept regional water-bearing fracture zones. Preliminary testing of the wells suggests that GSM can intercept groundwater that has significantly better quality before it enters into the main pit area and comes into contact with the pit floor. Due to Montana's nondegradation rules, some treatment of this water may be still be required before it can be discharged. However, the level of treatment could be considerably less than that proposed in the EIS. GSM is presently conducting treatment feasibility testing of this water using the existing water treatment plant located in the mill complex.

Letter 2 Continued

2-18 gradient ingress of groundwater into mine workings. Has any study or groundwater tracing consideration been given to up gradient source and groundwater flowpath(s) identification which might lead, at some future date, to minimizing the contact of up gradient higher quality groundwater with down gradient oxidizing metal-bearing sulfidic rocks in the open pit? In other words, it is suggested that the consideration of an appropriate study and possible subsequent implementation of groundwater source control. If pumping the Golden Sunlight pit effectively depresses the groundwater table surrounding the pit, could appropriate pumping (water table drawdown) of designated higher water quality area(s) up gradient of the pit and east of the groundwater divide, and directing this water to other beneficial use areas, below say the Steppan Original Springs area, be a reasonable strategy to assess?

Consideration of design for rapid waste rock pile and impoundment oxidation

2-19 We offer a design concept that may be in the company's interest for consideration in the future after completion of this Final EIS. The future reclamation plan "calls for reclamation caps to limit the infiltration of direct precipitation into waste rock dumps" (page 248). On page 259 the comment is made "the available data indicate that the cover (for reclaimed sites) provides no control of oxidation rates (Bennett 1997)."

It is commonly acknowledged among reclamation-remediation practitioners that the generation of hard rock mine waste rock metal-bearing ARD is dependent upon the simultaneous availability of (1) appropriate sulfide mineral surface, (2) oxygen, (3) moisture, (4) a temperature above the freezing point of water, and (5) a iron sulfide oxidizing bacteria such as Thiobacillus Ferrooxidans that accelerate the conversion of ferrous to ferric iron. The elimination of the presence of any one of these variables significantly retards the ARD reaction.

Additional thought could be given to the design of the aforementioned "reclamation caps" and the impact of waste rock capping decisions on the long term water management and water treatment plan. In this regard it is noted that springs (Arkose Valley, Sunlight and Midas) are in the East and West Dump Complexes, the presence of which may complicate any capping design.

The question to address is whether a reclamation cap should be designed to limit moisture penetration or to optimize it, considering that no control of oxygen penetration is possible. With the understanding that certainly three, possibly four, sources of GSM site water that will likely require perpetual water treatment, namely pit water (if source control can not be made to work), Tailings Impoundment No. 2 & possibly Impoundment No. 1 water and seepage from the west waste rock complex, would the further (at least conceptual and untested) optimization of all the above noted ARD favorable variables to achieve a rapid waste rock pile and impoundment(s) oxidation, perhaps over a relatively short term, say tens of years, be a better strategy than perpetual water treatment? In other words, could a certain (untested) design oxidize the sulfidic waste materials at the maximum possible rate that would be simultaneously environmentally protective and cost effective? We suggest that GSM and/or Placer Dome Inc. consider a future investigate (after completion of the ROD) analogous areas in Southwestern U. S. (sulfide-oxide

Response to Letter 2

The Agency-Preferred Alternative in the Draft EIS includes the Proposed Action as modified to include the No Pit Pond Alternative. The No Pit Pond Alternative includes a groundwater dewatering system to maintain the groundwater level at just below the 4,800-foot elevation. Part of this dewatering system could include groundwater capture upgradient of the pit. As stated in Section II.B.6, of the Draft EIS, depending on water quality, the discharge would be routed to the water treatment plant, or directly to a land application disposal area away from the pit.

Regarding the comment to direct the groundwater discharge (or treated discharge) to beneficial use areas, such as below the Steppan Original Spring area, Mitigation Measures W-1 and W-5 in the Draft EIS have been modified to include diversion of discharge from the dewatering system upgradient of the pit or water treatment plant (depending on quality) to provide water resources for wildlife/livestock beneficial uses. Directing water to the area below Steppan Original Spring to provide for beneficial uses may not be desirable since the Steppan Original Spring flows from a collapsed abandoned adit in a mineralized area.

2-19 This idea has been discussed informally among the staff of MDEQ and BLM for several years and was proposed by the EIS contractor as a possible mitigation measure. This approach would be most effective if all leachate from the waste rock dumps were to appear as surface seepage. In this case, GSM would be able to contain and collect 100 percent of the seepage. However since most of the seepage is expected to migrate as unsaturated flow into the underlying groundwater system, there could be greater environmental impact from accelerated ARD production that is not entirely captured by groundwater controls. Also, when considering the timing and duration of ARD generation as described in Appendix J, an extended time period will be required for capture and treatment with or without ARD acceleration. This would have an additional impact of maintaining the waste rock dumps in an unreclaimed status for an extended period of time, estimated to be at least 60 years by one reviewer (Bennett 1997).

Letter 2 Continued

2-19 copper mine dump leach; Tonkin Springs precious metal) where possibly applicable production and evaluations, respectively, of inhibiting and accelerating sulfide rock oxidation are underway.

Section III.B., Water Resources

2-20 Section III.B.1.c Selected water quality data for surface water should be included in this section and the reference for all surface water quality data should be provided. 2-21 The geologic maps included as Map III-1 and III-2 do not include detailed surficial geology for the area that includes the tailings impoundments and the down gradient area to the south. This map should be included.

2-22 Section III.B.2a -pg. 142 EPA recognizes that bedrock permeability can be characterized by an average permeability. However, the bulk permeability may not be very useful for characterizing or predicting ARD migration from the pit and the West Waste Rock Dump. As indicated in this section of the DEIS, bedrock permeability varies significantly on a local scale. Site specific permeabilities should be determined down gradient of the waste rock dump and the pit.

2-23 Section III.B.2a -p143 The data used to support the conclusion that there is a downward component to ground-water flow should be presented. Which (and how many) well pairs were used to determine vertical flow direction? Where are the well pairs located? Does this conclusion apply to all hydrostratigraphic units? It is especially important to understand the hydrologic connection between the Bozeman Group sediments and the alluvial deposits along the Jefferson River. Since the Bozeman Group is comprised of alternating lithologies, it would be helpful to include a description of the distribution of facies so preferential ground-water flow paths can be identified. The discussion should also include recharge and discharge conditions. A separate water table/potentiometric surface map for the Bozeman Group hydrostratigraphic unit should be included. The vertical direction of ground-water flow should also be determined for the Bozeman Group sediments. This is important because the ground water in the Bozeman Group sediments has been impacted by seepage from Impoundment No. 1 and this contaminated ground water has discharged to the Jefferson River alluvium.

2-24 EPA is concerned that the DEIS does not adequately describe the current extent and nature of the ground-water contamination plume down gradient of Impoundment No. 1, particularly with regard to dissolved metals. The data presented in the DEIS does not indicate that the plume is fully controlled. GSM should continue to investigate the extent and nature of this plume and implement additional mitigation measures as necessary.

2-25 Table III-1 could include ambient groundwater quality for groundwater wells southeast of the Project Site. This data is in Appendix B. Again this is important to adequately characterize and address the ground-water contamination from Impoundment No. 1.

2-26 EPA believes that it is especially critical to implement mitigation measure W-10 to adequately mitigate ground-water contamination that could result from migration of seepage from the West waste rock dump.

Response to Letter 2

2-20 Baseline surface water quality data for the Jefferson Slough is presented in GSM 1995a, 1995c, and 1996a. A reference to these baseline documents has been added to Section III.B.1.c. These documents were used to prepare the water quality summary presented in the Draft EIS.

2-21 A surficial geology map of the area would have limited usefulness since the surface expression of geologic materials does not specifically identify the true boundaries of the subsurface hydrostratigraphic units described in Section III.B. The narrative descriptions of the occurrence of various hydrostratigraphic units beneath mine facilities (Sections III.B.a through III.B.h) provide sufficient information for subsequent technical discussions of impacts and mitigation. Specifically, the hydrogeology of the impoundment areas is discussed in Section III.B.1. Additional detail on area hydrogeology is contained in the 1995 permit amendment application, GSM Annual Reports and earlier GSM construction reports by SHB Consultants on file at MDEQ and BLM.

2-22 Some site-specific permeability data downgradient of the pit and waste dump areas have been collected by GSM and are on file with MDEQ, BLM and GSM. Aquifer tests of the bedrock and packer testing of individual fracture zones in coreholes within the bedrock have been performed. These tests are summarized in Hydrometrics (1995). A reference to this report and a summary of the testing results have been added to Section III.B.2.a (Regional Groundwater System). In addition, GSM's long-term water management plan (Appendix A of the Draft EIS) proposes additional drilling and aquifer testing in the pit and waste rock areas to further characterize the hydrogeology of the bedrock.

2-23 The rationale for the statement regarding the downward component to groundwater flow was provided in a response to the EPA comments on the third Preliminary Draft EIS. Vertically-downward components to groundwater flow have been observed during drilling in bedrock within the pit area and at well pair PW-13/PW-14, and in paired Bozeman Unit wells GW-23/GW-24/GW-38 south of Impoundment No. 1. A downward gradient also is suggested from the Bozeman Unit (GW-42) into the Jefferson alluvial unit (OPB-1) along the southern boundary of the project area. The locations of these wells are shown in Appendix A of the Draft EIS. All hydrologic data collected at GSM since operations began are available for public review in reports on file at MDEQ and BLM.

It is impossible to provide detailed information on the distribution of facies within the Bozeman Unit. The alternating layers and lenses of sand, silt, clay, and fine gravel are thin and discontinuous as stated on page 142 in Section III.B.2.a. However, it can be inferred based on monitoring data that the preferential flow paths resulting from the distribution of such layers and lenses also are discrete and discontinuous. The monitoring of wells adjacent to Impoundment No. 1 give the best indication as to the significance of preferential flow paths in the Bozeman Unit. Based on this monitoring data, it can be concluded that the occurrence of permeable layers and lenses are frequent enough and interconnected to the degree that they provide an overall permeability to the unit. To date, the existence of preferential flow paths has not been a factor in GSM's ability to monitor groundwater conditions within the Bozeman Unit.

Response to Letter 2

As shown in the 1995 GSM Annual Report, the present array of monitoring wells shown in Appendix A of the Draft EIS has been proven to be adequate for delineating the extent of tailing seepage from Impoundment No. 1 in the Bozeman Unit. In this area, the only important preferential flow path was determined to be the alluvial unit that occupies the modern drainage overlying the Bozeman Unit beneath the impoundment. This unit was clearly identified at the beginning of operations at GSM by geologic mapping and test drilling.

The potentiometric map in the Draft EIS (Map III-6) provides the best available description of groundwater flow direction in the Bozeman Unit when considering the flow characteristics of the unit in general. A more detailed map of the impoundment area is in the 1995 GSM Annual Report on file with MDEQ and BLM. However, for prediction and monitoring purposes, the well array shown in Appendix A (Draft EIS) in combination with the potentiometric maps on file with the agencies are suitable for the Bozeman Unit, especially for the area south of the tailing impoundments.

2-24 The past and current extent and nature of the groundwater contamination plume downgradient of Impoundment No. 1 were addressed in Section III.B.2.f of the Draft EIS (pages 155-158). Although specific plume boundaries were not defined in the Draft EIS, the last paragraph of the "Historic Seepage from Tailings Impoundment No. 1" discussion (page 157) states that the present areal extent of the plume within the Bozeman Unit is generally limited to within 600 to 800 feet of the impoundment along its east and southeast flanks. (This plume is kept from slow migration into the Bozeman Unit by low permeability conditions and natural attenuation. Pumping from the SPB pumpback system also could influence migration from the southeast side of the impoundment. This information is in GSM annual reports on file with MDEQ and BLM.) In addition, it is stated in the "Evaluation of Historic Seepage Impacts to Current Groundwater Quality" (page 158) that impacts to groundwater downgradient of the pumpback wells after 1983 have been greatly reduced or eliminated.

Dissolved metals were not included in discussions of the Impoundment No. 1 downgradient contamination plume because elevated dissolved metals were not generally associated with the plume migration. Water quality data collected from groundwater wells downgradient of Impoundment No. 1 indicate that dissolved metals are typically low or below detection (page B-65), consistent with background metals concentrations described on page 143 for the Bozeman Unit. Instead of dissolved metals concentrations, elevated concentrations of cyanide were used as a more reliable indicator of plume migration.

GSM submitted an action plan to MDEQ in March 1997 to accelerate reclamation activities and investigate groundwater conditions downgradient of Impoundment No. 1. By the end of 1997, GSM placed a preliminary cap over 85 percent of the impoundment and constructed five new wells to monitor tailing dewatering and groundwater quality. GSM also began modeling the effectiveness of the present SPB system in an effort to optimize seepage containment. Additional work on the SPB system is scheduled for 1998.

Response to Letter 2

Additional analysis of available metals data from monitoring wells located around impoundment No. 1 was submitted by GSM in January 1998 in Attachment 3 of the revised mixing zone application entitled "Water Quality Regulatory Compliance and Application for Source Specific Groundwater Mixing Zone." The analysis confirms statements made in the EIS that metals concentrations drop to ambient levels a short distance from the impoundment. This is due to capture by the pumpback system and natural attenuation mechanisms in the Bozeman sediments.

2-25 The Draft EIS text states that Table III-1 summarizes groundwater quality data from 8 regions within the project area. The emphasis of the water quality data presentation in Table III-1 is to characterize ambient water quality, including representative dissolved metals concentrations. The groundwater wells southeast of the Project Site were sampled to evaluate potential impacts from seepage contamination, not to collect data representative of ambient water quality conditions. Analyses, therefore, typically focused on the determination of cyanide concentrations and did not include dissolved metals analyses (see Response to Comment 2-24). Because of the very limited dissolved metals data available from these wells, the data summary presented on page B-117 (Groundwater Wells - Southeast of Project Site) could be misleading to the reader if presented in the context of Table III-1.

Data from wells southeast of the project site were used in the evaluation of historic seepage impacts to current groundwater quality (page 155). This section of the Draft EIS is a more appropriate place to reference the data presented in Appendix B and omitted from Table III-1, and these references have been added to the text.

2-26 The agencies fully intend to require GSM to implement Mitigation Measure W-10 to characterize groundwater conditions downgradient of the pit and the West Waste Rock Dump.

Letter 2 Continued

Volume II

Appendix A

Pages A-23 through A-63, Design and Estimated Costs for Water Treatment Plan

2-27 The text is well written, detailed and clear as to the identification of deleterious site flows to be treated and the appropriate application of processes to be used for the treatment and removal of process streams containing TDS/metals, cyanide and nitrate. 2-28 Some caution is suggested in assuming that both cyanide and nitrate will not require treatment after year 10. The persistence of these compounds may be a negative surprise that should be addressed with a contingency factor and reflected in the financial assurance calculations.

2-29 After year ten, the water management treatment plan is based on treating only for TDS/Metals. The non-inflation (without escalation) cost basis results in an approximate cost of $897,000 on an annual basis. However, after ten years the sludge production estimate increases from 61 to 66 cubic yards/day (an increase of ~8.2%). This increase in sludge production, most likely, will increase annual O&M costs. If, however, the post 10-year O&M plan includes offsetting operating costs for the higher sludge production costs, this information should be reflected in the analysis.

2-30 As to inflation escalation, it is understood that bonding will be addressed following completion of the Final EIS and that the bond will be reviewed/updated to compensate for inflation on a regular basis (Bonding Commitment, pg 46, Chapter II, Volume I based on updating costs every 5 years).

Water Treatment Plant Sludge Production Estimates and Contingencies

EPA recommends that the lead agencies review and reassess the proposed water treatment plant daily sludge production. The text presently indicates that a range of from 17 to 93 cubic yards/day. Once the sludge production is settled, there will be a need to check that the assumptions are correct based on unit costs before calculating the total cost. After viewing these differences it probably would be appropriate to recheck all assumptions and calculations in the Appendix A-1 analysis.

2-31 "The total dewatered sludge volume to be land filled was calculated to be 93 cubic yards/ day" (Page A-59). "The total dewatered sludge volume to be land filled .....was calculated to be 61 cubic yards/day for years zero to ten and 66 cubic yards/day after year ten" (Page A-62).

The sludge production of 93 cubic yards/day and the estimates of 61 to 66 cubic yards/day of Volume II do not agree, nor does these data agree with the statements on page 49, Chapter II, Volume I, or with the design and statements of the Revised Sludge Disposal Plan of Appendix C, Volume II which advise 17 to 21 cubic yards/day , through year 10 and beyond year 10,

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Response to Letter 2

2-27 Comment noted.

2-28 Estimating water treatment requirements does indeed have numerous uncertainties. Many of the assumptions used in estimating the quality of the water to be treated are based on an estimation of the success of the reclamation plan and the modeling that it includes. The agencies do make assumptions regarding the quality of the water to be treated based on reasoned estimates of reclamation success; however, the agencies also include contingency factors to account for uncertainties. MDEQ and BLM are confident they can develop sound and principled contingencies to include in the water treatment estimate. See also the Response to Comment 2-2.

2-29 GSM is presently modifying its proposed treatment plant design to accommodate all potential inflow sources associated with the preferred alternative. Sludge volumes and long-term operation and maintenance costs are being reviewed as well. MDEQ and BLM will review and update all assumptions at the time of treatment cost estimating. See also Response to Comment 2-28.

2-30 MDEQ customarily includes an inflation adjustment factor for a 5-year interval. The amount of the adjustment is based on published indexes. By law, when MDEQ revisits the bond estimate every 5th year, the inflation factor also is examined. However, should there be a dramatic increase during the intervening 5-year period, MDEQ has the authority to adjust the bond to reflect the prevailing cost climate. BLM's policy is to require the bond be adequate to implement the approved reclamation plan. This, in conjunction with MDEQ's adjustment factor, will ensure the bond is adequate to perform any required reclamation.

2-31 GSM is presently modifying its proposed treatment plant design to accommodate all potential inflow sources and contingency flows associated with the preferred alternative. The daily sludge production has been recalculated, and the sludge volumes in Draft EIS Appendix C, and on page 49 of Volume I (Section II.B.1.b) have been corrected (see revised text). The estimated daily sludge volume is 66 cubic yards per day. The unit costs and total costs associated with water treatment indicated in Appendix A also will be revised, based on these corrections. The agencies will review and update all assumptions in calculating the final cost estimate for the water treatment plant as part of the overall bond determination.

Letter 2 Continued

2-31 respectively and the option to pump (as noted in Appendix A, Attachment A-1 as an alternative) rather than a truck haulage of sludge to the dump.

Appendix B - Water Quality Regulatory Compliance and Source-specific ground water mixing zones

2-32 Page B-7 It is stated here that actions of the former MDHES regarding GSM remedial efforts related to the seepage from Impoundment No. 1 constituted a clear recognition of a de facto mixing zone from Impoundment No.1 to the GSM property boundary. GSM efforts regarding control of migration of leachate from the impoundment were aimed at correcting a defective collection system, not at delineating an appropriate mixing zone for Impoundment No. 1. It might be more appropriate to indicate that the information obtained from effort to control leachate from impoundment No. 1 was utilized to develop the mixing zone.

2-33 Page B-12 It is noted that "once seepage emerges from the bottom of the waste rock dumps it must pass through an additional 300 feet of unsaturated Bozeman Group sediments before reaching the regional water table." Please provide a reference for the 300 foot depth to the water table. Which well or wells was this determined from? Depth to water in the Bozeman Group is well above 300 feet beneath much of the area east of the Golden Sunlight Pit.

2-34 Page B-24 It is stated here that "In the column tests, Bozeman Group materials were found to fully neutralize the first one or two pore volumes of ARD water." The quality of the column effluent was used as an indicator that the Bozeman Group sediments would effectively attenuate ARD and therefore no capture of seepage from the East Dump is necessary. It is of concern that only one or two pore volumes were fully attenuated. How many pore volumes were run through the columns? What was the effectiveness of the Bozeman sediments in attenuating ARD in subsequent pore volumes?

2-35 Also on page B-26 it states that, according to the mixing analysis, the seepage from the East Dump will be similar to ambient ground-water quality within 4400 feet of the toe of the dump. However, the ambient ground-water quality data for ground water down gradient from the East Dump (Area 3-included in a table on page B-91-Attachment 1) indicates that some of the ground water beneath this area is low in pH and high in dissolved copper, sulfate and nitrate. These data indicate that the ground water may have been impacted by mining activities. Therefore this may not be "ambient" water quality. It would be inappropriate to base a compliance goal that specifies that the seepage meet water quality standards that may be based on contaminated ground water.

2-36 It is suggested that a contingency ground-water collection system be included to capture seepage from the East Dump given the relatively elevated copper, sulfate and nitrate that could emanate from this location.

2-37 Page B-34 The Draft EIS does not indicate that a groundwater mixing analysis was used to evaluate an appropriate distance to the edge of the mixing zone down gradient of Impoundment No. 1 as it was for the West Waste Rock Dump. Data presented in the Draft EIS indicate that Impoundment No. 1 will continue to be a source of ARD well into the future. Data also indicate that a significant ground-water plume (cyanide and nitrate) extends from Impoundment No.1.

Response to Letter 2

2-32 Part of GSM's efforts to control the migration of seepage from Tailing Impoundment No. 1 included delineation of downgradient seepage migration by monitoring groundwater quality from monitoring wells and private wells. The extent of seepage migration identified from the remedial investigation then formed the basis for recognition of a de facto mixing zone and for delineating the mixing zone described in Appendix B. Further analysis has been completed, and a revised mixing zone application, which contains a mixing zone analysis for Tailings Impoundment No. 1, was submitted by GSM to MDEQ in January 1998 (GSM 1998). This is described in the Statement of Basis for the proposed mixing zone, attached as Appendix 1 of this Final EIS. See also the Response to Comment 2-37.

Citation:

Golden Sunlight Mines, Inc. 1998. Water Quality Regulatory Compliance and Application for Source Specific Groundwater Mixing Zone. January 1998.

2-33 The reference to 300 feet in Appendix B of the Draft EIS is a typographical error and has been corrected. Although several wells have been drilled that encountered water as deep as 300 feet below the land surface (e.g., PW-5 and PW-18), the depth to water table in the Bozeman Unit in the vicinity of the east waste rock areas is typically between 100 and 200 feet below the ground surface. Well drilling information is presented in the 1995 permit amendment application and is on file at MDEQ and GSM. For the time of travel analysis presented in Appendix J, a 200-foot depth to groundwater in the Bozeman is assumed for the 790-year time of travel mentioned on page B-12.

2-34 A total of ten pore volumes of simulated ARD water with pH of approximately 1.8 were passed through the columns. As stated, the first two pore volumes of ARD water were neutralized to pH of approximately 7. Subsequent pore volumes also were neutralized to some extent, ranging from nearly neutral in pore volume three to only slightly improved from the simulated ARD waters in pore volume ten. Column effluent from upper Bozeman sediments ranged from pH 6.5 in pore volume 3 to pH 3.5 in pore volume 10. Column effluent from lower Bozeman sediments ranges from pH 3.2 in pore volume 3 to pH 2.2 in pore volume 10.

2-35 The ambient groundwater referred to on page B-26 is primarily groundwater within Region 1B, the Bozeman Group sediments (Figure 3-1, Appendix B). Seepage from the East Waste Rock Dump area will primarily report to the Bozeman Group in groundwater Region 1B, and therefore this region is the most appropriate for comparison.

Region 3 referred to in the comment is outside of the primary flow path from the East Waste Rock Dump area. Region 3 consists of Rattlesnake Gulch, a deposit of colluvial material originating from Bull Mountain that constitutes a separate hydrostratigraphic unit, which is higher in elevation than the Bozeman Unit. The poor water quality in the Rattlesnake unit is uncharacteristic of the Bozeman. The occurrence of higher than average metals concentrations in Rattlesnake Gulch is a result sulfide mineral oxidation (principally as a result of natural weathering processes) originating from a small ore body on Bull Mountain. Rattlesnake Gulch is a natural flow path downgradient from this source.

Response to Letter 2

2-36 An East Waste Rock Dump groundwater capture system is already proposed as a contingency to control migration of impacted groundwater if needed. This contingency is described in the water management plan (Appendix A), and in the Contingency Plan section of the mixing zone application (Appendix B, page B-48). Mitigation Measure W-4(a) on page 275 also addresses this issue.

2-37 A revised mixing zone application, which contains a mixing zone analysis for Tailings Impoundment No. 1, was submitted by GSM to MDEQ in January 1998 (GSM 1998). The tailings seepage quality and the ambient groundwater quality downgradient from the impoundment (GSM 1998, Attachment 3) were used to establish the mixing zone and the requirements for pumpback capture efficiency. The mixing zone analysis for the impoundment No. 1 seepage is described in the mixing zone Statement of Basis (attached to the Final EIS as Appendix 1). The primary control for seepage migration and future ARD impacts that may originate from Impoundment No. 1 is the continued operation of the pumpback well system. See also the Responses to Comments 2-24 and 2-33.

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Letter 2 Continued

2-37 A mixing zone analysis should be completed for this area using: (a) the quality of the leachate from Impoundment No. 1, (b) the flux and quality of ground water flowing underneath the impoundment in Rattlesnake channel and the ambient ground-water quality estimated for Regions 4A and 2A. This is necessary to help establish an appropriate boundary for the mixing zone for the impoundment.

2-38 Data from only three wells was used to calculate ambient ground water quality data for areas down gradient of the east flank of the West Waste Rock Dump. This reduces the confidence in the mixing analysis for the seepage from the east flank of the dump. This clearly is an indication that a capture system is warranted.

2-39 Tables 4-2 and 4-3. There is no pH value for the ambient ground water quality presented in Tables 4-2 and 4-3. This data should be included in the Final EIS.

2-40 Also please provide a reference for the assumed precipitation infiltration value of 0.5 inches per year.

2-41 Pages B-137 and B-142. The summary water quality data for the west flank and east flank ambient ground-water quality regions are not included in Attachment 1-pages B-137 and B-142. The summary data should be included as it is for the other ambient ground-water quality regions.

2-42 Section 4.3 What is the basis for the proposed compliance limit of 2000 mg/l for sulfate at proposed compliance well OW-2? It is stated that the basis is "maintenance of sulfate levels in down gradient wells." However not all down gradient wells have sulfate concentrations near 2000 mg/l. It should also be noted that the high sulfate in the domestic wells is very likely a result of contamination due to mining activities. There is no firm basis for the proposed compliance limit.

2-43 Sulfate concentrations in ground water down gradient from mine facilities should be mitigated by collection and treatment. This is necessary because the sulfate concentrations are not readily attenuated by mixing as indicated by the mixing analyses conducted for this Draft EIS.

2-44 Figure 5-1. We suggest reconsideration of the proposed mixing zone boundary shown in Figure 5-1 so that the boundary does not extend south of I-90. This would reduce the potential risk of ARD contaminants migrating to and reaching the Jefferson River alluvial aquifer.

2-45 For the discussion of mitigation measure W-4 on page six a ground-water capture system will be constructed to intercept seepage from the East Waste Rock Dump if water quality data from monitoring wells at the down gradient boundary of the mixing zone indicate impacts to ground water from the East Waste Rock Dump. However in Appendix B -Fig. 5-1, it shows that the nearest proposed compliance well is PW-22. Is this well properly located and screened to serve as a compliance well for potential seepage from the East waste rock dump? If not, a new well location and screened interval should be proposed.

2-46 In addition, we suggest that one or two compliance wells should be located immediately down gradient of Impoundment No. 1 since this is an important source of ARD seepage.

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Response to Letter 2

2-38 The fact that only three wells are used to assess ambient water quality downgradient of the east flank of the west waste rock dump does not reduce the confidence of the mixing zone analysis and does not warrant automatic use of the contingency capture system. The ambient water quality data indicate that ARD constituents occur naturally in close proximity to mineralized areas of Bull Mountain (well PW-17), and that ARD constituents are naturally attenuated with distance away from these areas (Steppan Original Spring and well PW-22). The contingency for groundwater capture will remain, and will be used as necessary to ensure that compliance limits are met.

2-39 The ambient pH value for the wells used in the mixing zone analysis are included in Attachment 1 to Appendix B. GSM has submitted a revised mixing zone application to MDEQ that now includes pH values in Tables 4-3 and 4-4.

2-40 The 0.5 inch per year infiltration rate is given in Draft EIS Appendix J and is already referenced in table footnote (2) as the EIS "Expected" Case.

2-41 Summary data are included in the tables for the east flank and west flank regions on pages B-137 and B-142 under the category "Overall WQ." These data were not made into separate tables, but nonetheless are clearly identifiable to the reader.

2-42 The sulfate compliance limit has been changed. GSM has submitted a revised mixing zone application to MDEQ (GSM 1998), which includes provisions for sulfate and other common ions that do not have specific numerical standards (see Appendix 1 of the Final EIS). Groundwater quality with regard to these substances can be classified for regulatory purposes based on the specific conductivity (SC) of the water. Montana regulations have identified four classes of groundwater on the basis of SC (ARM 17.30.1002). Compliance at GSM would be evaluated based on maintaining existing Montana groundwater classifications at the mixing zone boundary.

There is no evidence that high sulfate values in downgradient domestic wells are a result of contamination caused by mining activities. Elevated sulfate occurs naturally in the area, particularly south of the mineralized areas of Bull Mountain.

2-43 Water quality data from private wells in Appendix B indicate that sulfate concentrations diminish with proximity to the Jefferson Slough and the center of the valley. This is a direct result of dilution/attenuation within the Jefferson alluvial aquifer.

Response to Letter 2

2-44 The proposed mixing zone boundary incorporates only that portion of the Jefferson alluvial aquifer immediately adjacent to the site and does not impact beneficial uses of the water. This area is a necessary and important component of the mixing zone for the following reasons:

1. The northern margin of the Jefferson alluvial aquifer is the natural flow path for groundwater that flows from the GSM project area. It is part of the existing mixing zone for historic seepage from Impoundment No. 1.

2. The alluvial material is preferred for discharge of treatment plant water because of its permeability characteristics. Also, there will be additional mixing effects that are provided by the Jefferson alluvial aquifer. This is an important safety factor that was not included in the mixing zone analysis.

3. Water quality trends from wells in the Jefferson alluvial aquifer show that sulfate and specific conductance concentrations in the Jefferson alluvial aquifer significantly diminish within a relatively short distance towards the Jefferson Slough and center of the valley. The dilution/attenuation processes that occur along this margin of the Jefferson alluvial aquifer are important factors ensuring compliance limits are achieved at the mixing zone boundary.

Previous monitoring data show that historic seepage from Impoundment No. 1 did not impact the alluvial aquifer south of the proposed mixing zone compliance boundary. Based on the historic flow path of this seepage, it appears that seepage concentrations are reduced with proximity to the Jefferson Slough. This means that the potential risk of ARD impacts to beneficial water uses also will be reduced in the alluvial aquifer with distance from the project area.

2-45 &
2-46 Well PW-22 was constructed specifically as a downgradient monitoring well for the east flank of the West Waste Rock Dump. Well completion records for this well are on file with MDEQ. The well was completed to a depth of approximately 270 feet below the land surface after encountering significant groundwater inflow at 255 feet. Solid PVC casing was set from the surface to 230 feet, and slotted casing was installed between 230 and 270 feet. The annular space between the well casing and the borehole is sealed from the surface to 180 feet, and open from 180 to 270 feet. It also should be noted that the interim compliance wells identified in Appendix B are not the only wells that will be used for post closure groundwater compliance monitoring. Appendix A (Draft EIS) describes a post closure monitoring plan that will be used as the basis to implement specific mitigation measures. The monitoring plan and locations of existing and proposed monitoring wells are in Attachment A-2 to Appendix A. Additional compliance monitoring sites will be identified jointly by MDEQ, BLM and GSM as stated in Section 6.0 of Appendix B in the Draft EIS. The monitoring sites will be located in a manner that ensures that flows related to important sources of seepage are adequately monitored. See also the Response to Comment 18-30.

Letter 2 Continued

Appendix D, Economic Analysis For Complete Pit Backfilling

2-47 Suggested is the addition of analysis for Low Range Profit Estimates to include a Gold Price of $300 per ounce in addition to the $400 per ounce and $350 per ounce prices to allow at least a sense of the range of late 1997-early 1998 financial impact with three points on the profit estimate (and loss) curve. A fourth point of $250 per ounce, at Golden Sunlight, for all practical purposes, is probably out of the question.

Appendix H, Draft 404(b)(1) Analysis regarding the diversion channel around the East Waste Rock Dump

2-48 The proposed Return Diversion Alternative 1,600 foot long Sheep Rock Creek diversion channel around the East Waste Rock Dump is stated to incorporate armoring and energy dissipation structures, as necessary, to protect the integrity of the bed and banks. We suggest that the specifics of the armoring and energy dissipation structures be described in the draft 404(b)(1) analysis (Appendix H).

2-49 We recommend against building energy dissipation structures that pool water in the diversion channel adjacent to the waste rock dump, since such ponding could cause percolation of storm water into the ground adjacent to the rock pile, potentially resulting in increased transport of ARD leachate from the waste rock pile down gradient.

2-50 We also recognize some potential for erosion of the smaller unnamed tributary to Sheep Rock Creek that will receive return diversion flows around the East Waste Rock Dump (for the Return Diversion Alternative). It is noted that mitigation measure W-3 (page 378) indicates that GSM has committed to visually inspecting the diversion channel and the unnamed tributary to Sheep Rock Creek. We believe, however, that this mitigation measure should more clearly and unequivocally state that GSM will stabilize the unnamed tributary as needed to prevent erosion of the bed and banks, and thus, avoid transport of eroded channel sediments downstream into the main channel of Sheep Rock Creek and the Jefferson River.

Conservation easements for project mitigation

2-51 Has GSM entered into conservation easements for the 4,371 acres of land it purchased for mine project mitigation and wildlife habitat enhancement to protect these areas from future development? (These lands include the 3,200 acre former Candlestick Ranch, 531 acre Piedmont Swamp, and 640 acres in the Bull Mountains.) We recommend that conservation easements be obtained to ensure future protection of land acquired for wildlife habitat and project mitigation.

Response to Letter 2

2-47 The purpose of this analysis was to show the economic feasibility of completely backfilling the pit. The analysis demonstrates that it is not feasible at a low range estimate of $350 per ounce of gold. It can be inferred that complete backfilling also would not be economically feasible at prices lower than this.

2-48 This level of detail is not required for the EIS. Sufficient information has been provided on which to base the analysis of the alternative. GSM is required to submit detailed design plans to the agencies for approval prior to construction. The design must meet the requirements of MDEQ and BLM.

2-49 Armoring and energy dissipation structures for the return diversion will be sized and located based on field measurements. The diversion will be designed to prevent contact between ephemeral storm water flow and waste rock. Therefore, any water control structures that would result in ponding ephemeral flow against waste rock or creating the potential for water to come into contact with waste rock would not be used. See also Response to Comment 2-48.

2-50 On page 378 of the Draft EIS, Mitigation Measure W-3 states that "[p]eriodic examination of these channels and maintenance would be performed. Maintenance would include the addition of erosion protection in affected channel reaches, and/or installation of check dams or other grade control structures." The agencies feel that this language is sufficient to provide for adequate mitigation of potential erosion effects. If this mitigation measure is stipulated to the operating permit through the Record of Decision, GSM will be required to implement it.

2-51 GSM intends to enter into a future land trade agreement with the BLM for the Piedmont Swamp and for approximately a third of the Candlestick Ranch. BLM will then have the ability to ensure that wildlife habitat is protected into the future. GSM intends to place conservation easements on two wetland sites within the Candlestick Ranch that were created/enhanced as mitigation for past placement of fill materials at the mine site. A draft easement has been prepared and will be finalized in mid-1998. The easement will be attached to any transfer of land ownership (Seybert 1998).

Citation:

Seybert, B., Golden Sunlight Mines, Inc. Personal communication with D. Williams, BLM, Butte, March 1998.

Letter 3

MONTANA CHAMBER OF COMMERCE
[illegible]

RECEIVED
JAN 21 1998
[illegible]

January 16, 1998

Mr. Greg Hallsten
Montana Department of Environmental Quality
PO Box 200901
Helena, MT 59620-0901

Dear Mr. Hallsten:

The Montana Chamber wishes to compliment MDEQ for completing the long awaited DEIS concerning the Golden Sunlight Mine.

The Montana Chamber of Commerce strongly supports Golden Sunlight Mine in its quest for a permit that will allow the mine to keep operating. We urge MDEQ to issue a permit authorizing the mine to proceed as proposed. Just as important, we urge you to make this permitting decision in time to avoid an unnecessary shut down of the mine.

Golden Sunlight Mine has a record that proves that they represent what all Montanans want, good-paying jobs that coexist with environmental protection. Montana's economy needs precisely the kind of jobs Golden Sunlight has created, jobs that are not only high-paying but which require productivity that in turn supports literally hundreds of other good-paying jobs in Montana. If Montana is to ever achieve an economic standard of living that matches the national average it is critically important that we maintain our focus on our primary, wealth creating industries. These industries include manufacturing, tourism, agriculture and natural resources such as timber and mining.

The Chamber truly believes that Montana should make use of its natural resource advantages and that recent history has more than demonstrated this can be done with a sensitivity to protecting the environment for future generations. It is also fair to note that all Montanans benefit from state and local tax revenue derived from operations like the Golden Sunlight Mine.

This is a mine whose workforce cares as much about preserving Montana's environmental quality as it does about its own, long-overdue need for certainty about future employment. A promptly issued permit will be in the best interests of all Montanans.

Respectfully,

David Owen
President

Response to Letter 3

Thank you for your letter. No response necessary.

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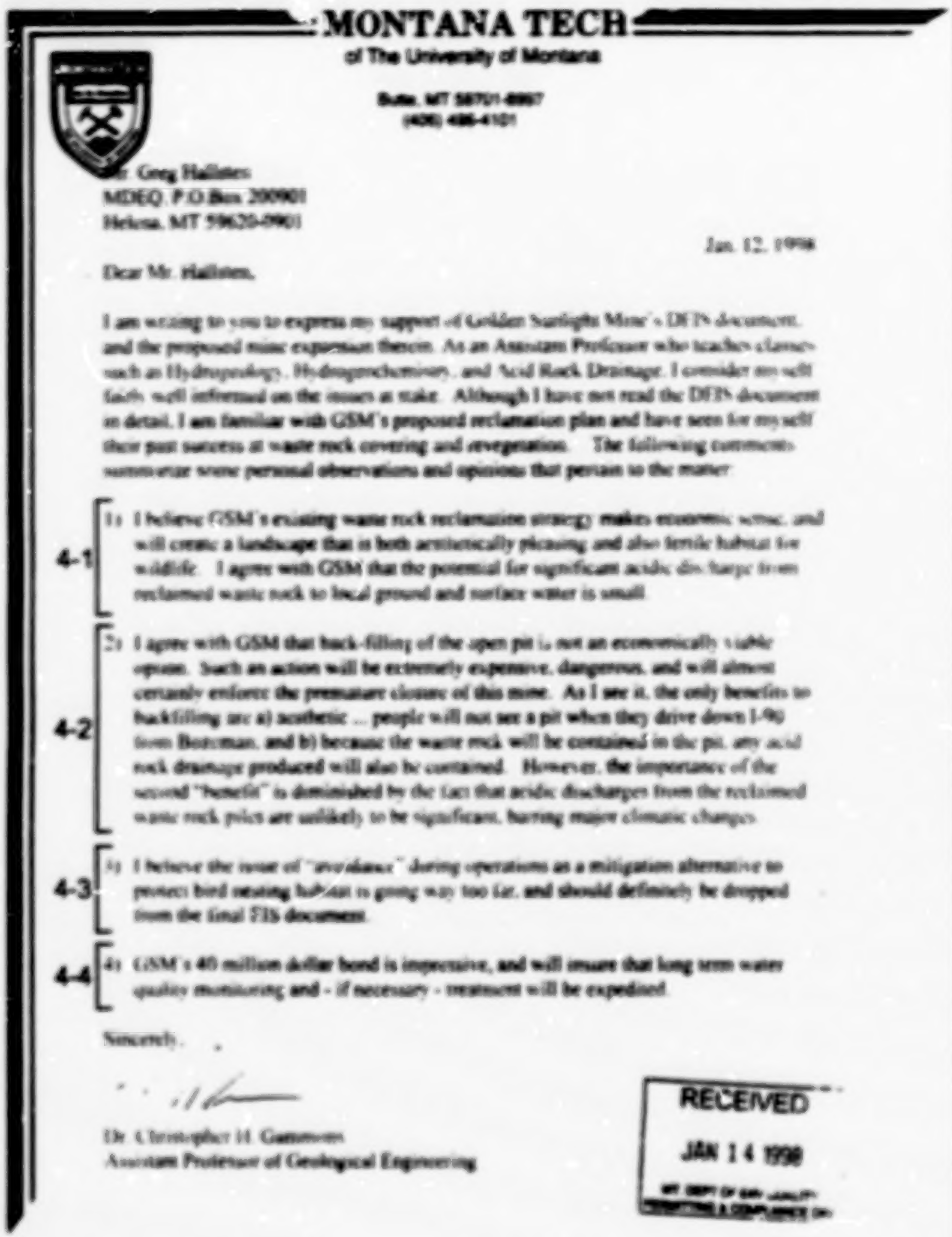
Letter 4



MONTANA TECH
of The University of Montana
Butte, MT 59701-8997
(406) 496-4101

Mr. Greg Hallsten
MDEQ, P.O.Box 200901
Helena, MT 59620-0901

Jan. 12, 1998

Dear Mr. Hallsten,

I am writing to you to express my support of Golden Sunlight Mine's DEIS document, and the proposed mine expansion therein. As an Assistant Professor who teaches classes such as Hydrogeology, Hydrogeochemistry, and Acid Rock Drainage, I consider myself fairly well informed on the issues at stake. Although I have not read the DEIS document in detail, I am familiar with GSM's proposed reclamation plan and have seen for myself their past success at waste rock covering and revegetation. The following comments summarize some personal observations and opinions that pertain to the matter:

4-1 1) I believe GSM's existing waste rock reclamation strategy makes economic sense, and will create a landscape that is both aesthetically pleasing and also fertile habitat for wildlife. I agree with GSM that the potential for significant acidic discharge from reclaimed waste rock to local ground and surface water is small.

4-2 2) I agree with GSM that back-filling of the open pit is not an economically viable option. Such an action will be extremely expensive, dangerous, and will almost certainly enforce the premature closure of this mine. As I see it, the only benefits to backfilling are a) aesthetic ... people will not see a pit when they drive down I-90 from Bozeman, and b) because the waste rock will be contained in the pit, any acid rock drainage produced will also be contained. However, the importance of the second "benefit" is diminished by the fact that acidic discharges from the reclaimed waste rock piles are unlikely to be significant, barring major climatic changes.

4-3 3) I believe the issue of "avoidance" during operations as a mitigation alternative to protect bird nesting habitat is going way too far, and should definitely be dropped from the final EIS document.

4-4 4) GSM's 40 million dollar bond is impressive, and will insure that long term water quality monitoring and - if necessary - treatment will be expedited.

Sincerely,

Dr. Christopher H. Gammons
Assistant Professor of Geological Engineering

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JAN 14 1998
MT DEPT OF ENV. QUALITY
PERMITTING & COMPLIANCE DIV.

Response to Letter 4

4-1 Comment Noted.

4-2 Comment noted. This comment reflects a misunderstanding of the analysis contained in the EIS regarding pit backfilling and ARD impacts. Waste rock and ARD would not be contained within the pit under the Partial Backfill Alternative. Anticipated ARD impacts for the Golden Sunlight Mine are described in Section IV.B, Water Resources. These impacts will require water treatment and other measures to ensure that water quality is protected. Regarding backfilling, see the Response to Comment 23-5.

4-3 Comment Noted. Please see the Response to Comment 23-3.

4-4 Comment Noted. As described in the Draft EIS, water treatment will certainly be necessary.

Letter 5

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JAN 26 1998
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#31

RESOLUTION 05-98

A RESOLUTION IN SUPPORT OF THE DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR GOLDEN SUNLIGHT MINE

WHEREAS, Golden Sunlight Mine has been in operation in Jefferson County since 1983, and

WHEREAS, Golden Sunlight Mine has been a good neighbor to the people of Jefferson County, and

WHEREAS, Golden Sunlight Mine has provided good paying jobs to Montana workers, and

WHEREAS, Golden Sunlight Mine has invested substantial money, time and energy into meeting environmental protection goals, and

WHEREAS, Golden Sunlight Mine has located gold reserves that could extend the life of the mine for another seven years, and

WHEREAS, Golden Sunlight Mine has an annual payroll in excess of $10 million, annual spending that exceeds $30 million for goods and services, and each year produces over $2 million in payroll, production and property taxes that benefit all of Jefferson County and Montana, and

WHEREAS, the Montana Department of Environmental Quality has completed a Draft Environmental Impact Statement for a proposed expansion at Golden Sunlight, and

WHEREAS, the Draft Environmental Impact Statement makes it clear that backfilling the pit would not be economically feasible and would have little benefit to the environment

NOW, THEREFORE, BE IT RESOLVED that Jefferson County fully supports the Draft Environmental Impact Statement prepared for Golden Sunlight Mine and the adoption of the preferred alternative

Response to Letter 5

Thank you for your letter. No response necessary.

Letter 5 Continued

BE IT FURTHER RESOLVED that Jefferson County encourages the Montana Department of Environmental Quality to finalize the EIS as quickly as possible to minimize economic hardships on Golden Sunlight Mine.

DATED this 14 day of January, 1998

ATTEST
Bonnie Ramey, Clerk & Recorder

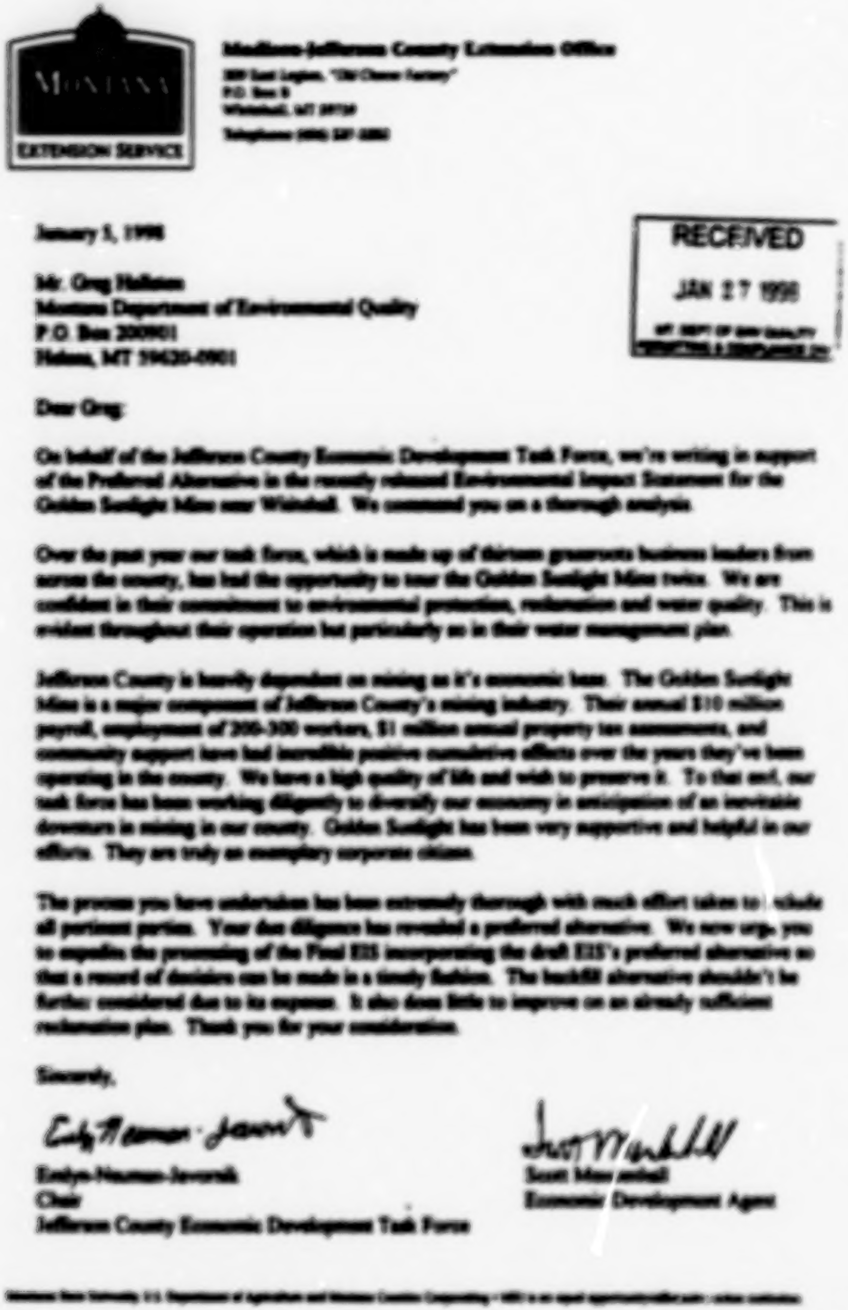
Glenna Obie, Chair

Leonard Wortman, Commissioner

Sam Samson, Commissioner

Response to Letter 5

Letter 6



MONTANA
EXTENSION SERVICE

Madison-Jefferson County Extension Office
[illegible], "Old Cheese Factory"
P.O. Box [illegible]
Whitehall, MT [illegible]
Telephone [illegible]

RECEIVED
JAN 27 1998
MT. DEPT OF ENV QUALITY
PERMITTING & COMPLIANCE DIV.

January 5, 1998

Mr. Greg Hallsten
Montana Department of Environmental Quality
P.O. Box 200901
Helena, MT 59620-0901

Dear Greg:

On behalf of the Jefferson County Economic Development Task Force, we're writing in support of the Preferred Alternative in the recently released Environmental Impact Statement for the Golden Sunlight Mine near Whitehall. We commend you on a thorough analysis.

Over the past year our task force, which is made up of thirteen grassroots business leaders from across the county, has had the opportunity to tour the Golden Sunlight Mine twice. We are confident in their commitment to environmental protection, reclamation and water quality. This is evident throughout their operation but particularly so in their water management plan.

Jefferson County is heavily dependent on mining as it's economic base. The Golden Sunlight Mine is a major component of Jefferson County's mining industry. Their annual $10 million payroll, employment of 200-300 workers, $1 million annual property tax assessments, and community support have had incredible positive cumulative effects over the years they've been operating in the county. We have a high quality of life and wish to preserve it. To that end, our task force has been working diligently to diversify our economy in anticipation of an inevitable downturn in mining in our county. Golden Sunlight has been very supportive and helpful in our efforts. They are truly an exemplary corporate citizen.

The process you have undertaken has been extremely thorough with much effort taken to include all pertinent parties. Your due diligence has revealed a preferred alternative. We now urge you to expedite the processing of the Final EIS incorporating the draft EIS's preferred alternative so that a record of decision can be made in a timely fashion. The backfill alternative shouldn't be further considered due to its expense. It also does little to improve on an already sufficient reclamation plan. Thank you for your consideration.

Sincerely,

Evelyn-Nauman-Javorsk
Chair
Jefferson County Economic Development Task Force

Scott Marshall
Economic Development Agent

Montana State University, U.S. Department of Agriculture and Montana Counties Cooperating • MSU is an equal opportunity/affirmative action institution.

Response to Letter 6

Thank you for your letter. No response necessary.

Letter 7

THE BUTTE MONTANA CHAMBER

RECEIVED
JAN 22 1998
MT DEPT OF ENV QUALITY
PERMITTING & COMPLIANCE DIV.

January 20, 1998

Mr. Greg Hallsten
MDEQ
P.O. Box 200901
Helena, Montana 59620-0901

Mr. Dave Williams
BLM-Butte District
P.O. Box 3388
Butte, Montana 59702

Dear Mr. Hallsten:

We are deeply concerned about the future of the Golden Sunlight Mine at Whitehall. Our Board has reviewed the draft EIS and feels that it would be extremely difficult to do a more thorough document than this one. Nearly everyone on our Board is a native. We all have children and many have grandchildren living in the area so we are always concerned about the environment. At the same time we can't help but be concerned about the economic future of southwest Montana.

Most of us have visited the mine and have been very impressed with the environmental progress that has been made. The Company is a shining example of a group that truly cares about the future.

Golden Sunlight is a major contributor to Montana's economy. Delays will jeopardize the mining operation. The price of gold is already low and we certainly don't want this company to fail.

Golden Sunlight has worked with us for several years in providing tours for the grade school children. Our Economic Education committee has worked closely with them in teaching the youngsters that you can have natural resource jobs and still protect the environment. They also have worked with us in the tourism industry by providing tours for any visitor who wishes to see the mine. Golden Sunlight made a generous donation to the building fund for our new Chamber, Visitor & Transportation Center. Company leaders understand how important the tourism industry is to Montana.

We urge DEQ and BLM to expedite preparation of the final EIS by incorporating the draft EIS as it stands. Thank you for your consideration in this matter.

Sincerely,

Ed Orizetti, President
Butte Chamber of Commerce

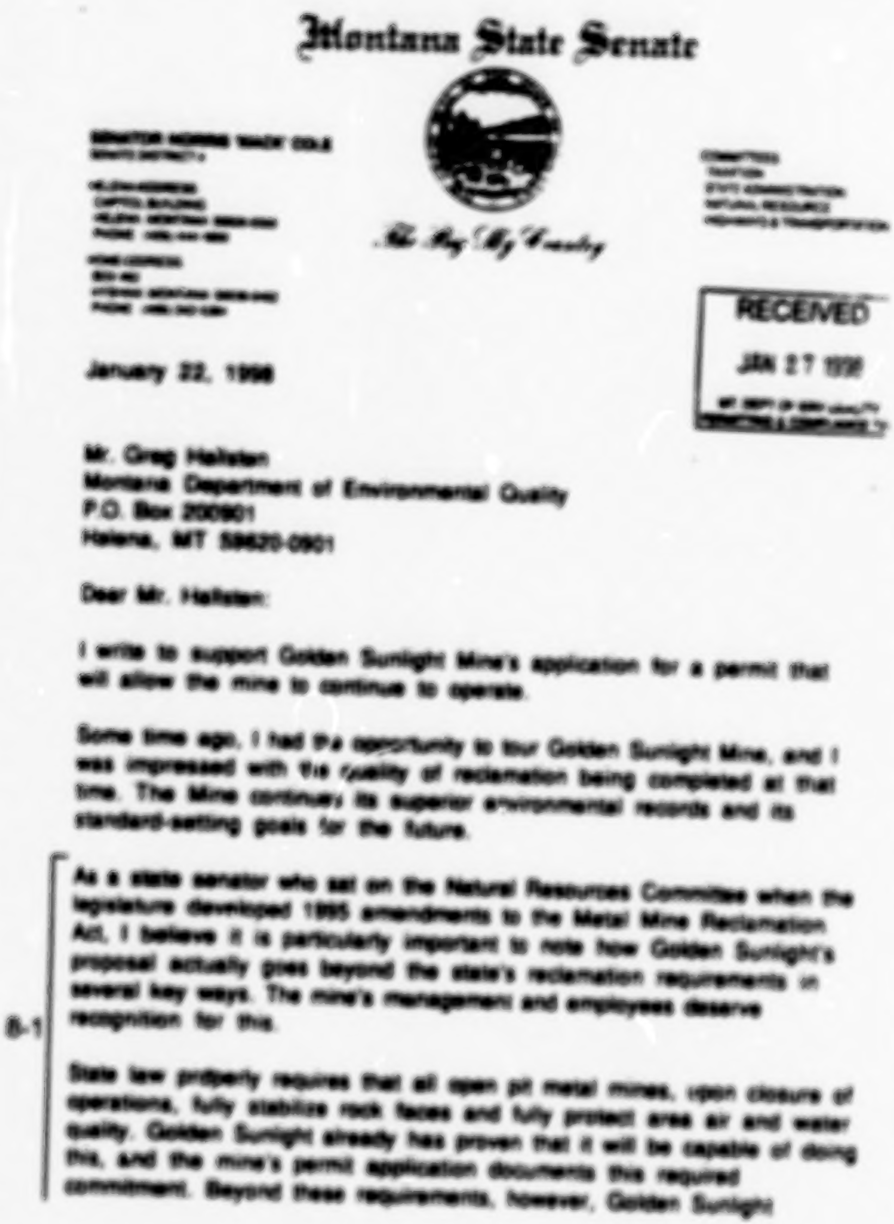
Connie Kenney, Executive VP
Butte Chamber of Commerce

1000 George Street
Butte, Montana 59701
Telephone: 406-723-3177
FAX: 406-723-1215 • 1-800-735-6814
http://www.butteinfo.org

Response to Letter 7

Thank you for your letter. No response necessary.

Letter 8



Montana State Senate

[illegible]

The Big Sky Country

RECEIVED
JAN 27 1998
[illegible]

January 22, 1998

Mr. Greg Hallsten
Montana Department of Environmental Quality
P.O. Box 200901
Helena, MT 59620-0901

Dear Mr. Hallsten:

I write to support Golden Sunlight Mine's application for a permit that will allow the mine to continue to operate.

Some time ago, I had the opportunity to tour Golden Sunlight Mine, and I was impressed with the quality of reclamation being completed at that time. The Mine continues its superior environmental records and its standard-setting goals for the future.

8-1 As a state senator who sat on the Natural Resources Committee when the legislature developed 1995 amendments to the Metal Mine Reclamation Act, I believe it is particularly important to note how Golden Sunlight's proposal actually goes beyond the state's reclamation requirements in several key ways. The mine's management and employees deserve recognition for this.

State law properly requires that all open pit metal mines, upon closure of operations, fully stabilize rock faces and fully protect area air and water quality. Golden Sunlight already has proven that it will be capable of doing this, and the mine's permit application documents this required commitment. Beyond these requirements, however, Golden Sunlight

Response to Letter 8

8-1 Comment noted. Please see the Responses to Comments 16-37 and 23-5.

Letter 9

Montana State Senate

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JAN [illegible] 1998

January 5, 1998

Greg Hallsten
Montana Department of Environmental Quality
P.O. Box 200901
Helena, MT 59620-0901

Dear Mr. Hallsten:

As a state senator whose district includes Jefferson County and the Golden Sunlight Mine, I write in strong support of the mine's application for a permit to continue operating.

The company has worked diligently and waited patiently while regulatory agencies developed the recently released Draft Environmental Impact Statement on the proposed permit. The result is an exhaustive document, comprehensive in its analyses.

Golden Sunlight has shown by its consistently responsible record of operation that it is a good neighbor, with a workforce that seeks to attend carefully to environmental protection goals beyond even the high standards required by Montana law. The company's reclamation plan is perhaps the most dramatic example of Golden Sunlight's
9-1 determination to set a new and higher standard for modern mining in Montana. The mine proposes to meet with company Montana's requirements that reclamation ensure the stability of open pits and rock faces, and that all surrounding air and water resources be protected. Beyond what is required, however, Golden Sunlight also plans to ensure that reclaimed lands provide productive habitat for diverse wildlife species, and to soften the visual impacts of the pit with procedures that eventually will leave evidence of modern mining nearly invisible. In short, the mine's long-term reclamation plan more than meets the requirements of the reclamation law (HB 558) that I co-sponsored in the 1993 session of the Legislature. In fact, I believe it is clear that Golden Sunlight will leave both the mine site and its surroundings more productive from a wildlife habitat standpoint than the area was before modern mining began in 1983.

Golden Sunlight Mine exemplifies how effective environmental protection -- and even environmental enhancement -- can come as a direct consequence of responsible resource development. I know I am not alone in finding this true, and I have been proud to represent literally thousands of Montanans who agree. When environmental conscientiousness of this caliber also provides hundreds of good-paying jobs not only for miners but also for those whose livelihoods depend on mining, and provides important tax revenues that benefit all Montanans, the operation deserves strong support.

Because the Draft EIS and the mine's track-record to date both document that Golden Sunlight operates in the best interests of all the citizens of this state, I urge you to issue a permit to allow the proposed [illegible] seasons of mining -- and to do so before the operation finishes the work authorized by its current permit.

Sincerely,

Mike Foster

Senator Mike Foster
Senate District [illegible]

cc: Mark Simonich, Director of DEQ
Dave Williams, Bureau of Land Management

Response to Letter 9

9-1 Comment noted. Please see the Response to Comment 16-37.

Letter 10

MONTANA STATE SENATE

SENATOR CHUCK SWYSGOOD
SENATE DISTRICT 9
BEAVERHEAD,
MADISON & PART
OF GALLATIN COUNTIES

COMMITTEES:
FINANCE AND CLAIMS
NATURAL RESOURCES
HIGHWAYS AND TRANSPORTATION
BILLS AND JOURNAL

CAPITOL STATION
HELENA, MONTANA 59620
HOME ADDRESS:
106 S. ATLANTIC
DILLON, MT 59725
[illegible]

January 16, 1998

RECEIVED
JAN 21 1998
MT. DEPT OF ENV. QUALITY
PERMITTING & COMPLIANCE DIV.

Mr. Greg Hallsten
Montana Department of Environmental Quality
PO Box 200901
Helena MT 59620-0901

Dear Mr. Hallsten:

Please consider my comments in your review of the permitting question concerning Golden Sunlight Mine and the recently issued Draft Environmental Impact Statement (DEIS).

The mine's 200-plus employees and their families, the employees of numerous small businesses around the state who benefit from Golden Sunlight's in-state spending of over $18 million per year, and the local schools and state and local government tax bases, all hang in the balance over this permitting issue. They have waited and waited for years to obtain a measure of economic security in their lives that all Montanans deserve.

You have developed a very thorough DEIS that comprehensively describes the alternatives and, in my judgment, properly concludes that a permit should be issued in accordance with Golden Sunlight's proposal. This is not surprising given the mine's track record and its employees' constant focus on protecting and even improving the area's environmental qualities.

Montana's economy needs the good-paying jobs and tax revenues Golden Sunlight offers. Montanans and the world need and use daily the metals this mine produces. There is no justifiable reason not to support such an operation whose employees also have proven their determination to set the highest-quality standards in Montana mining history.

10-1 Golden Sunlight's proposal is the only alternative in the DEIS that not only meets Montana's minimum requirements for reclamation but also satisfies the maximum, ideal standards the Legislature set forth in the state's reclamation law. I took part in the Legislature's debates and decision-making that in 1995 produced important amendments to the reclamation laws, and I can assure you that the Legislature never intended for any modern mine to be required to backfill its pit operation upon closure unless doing so would produce clear and substantial environmental benefits that would not waste resources and that would not risk precluding the application of future, improved technologies at the same location. Golden Sunlight proposes to meet a new, highest standard for reclamation, and the mine and its employees deserve a timely and favorable permitting decision.

I urge you to expedite your process to ensure that Golden Sunlight won't shut down unnecessarily this year, thereby devastating Montana families and local economies.

Sincerely,

Senator Chuck Swysgood

cc: Mr. Mark Simonich, Governor Marc Racicot

Response to Letter 10

10-1 Comment noted. Please see the Response to Comment 16-37.

Letter 11

The Big Sky Country

MONTANA HOUSE OF REPRESENTATIVES

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January 17, 1998

RECEIVED
JAN 21 1998
MT. DEPT OF ENV QUALITY
PERMITTING & COMPLIANCE DIV.

Mr. Greg Hallsten
Montana Department of Environmental Quality
PO Box 200901
Helena, Montana 59620-0901

Mr. Hallsten:

This letter is to provide formal comment on the Golden Sunlight Mine DEIS, as a supplement to the oral testimony I gave at your public hearing in Whitehall.

As the sponsor of 1995 legislation that strengthened Montana's metal mine reclamation requirements, I want to clarify my views on the law, the Legislature's intent, and how Golden Sunlight's proposal corresponds to the requirements.

In short, I think there is no question but that Golden Sunlight plans to surpass both Montanans' expectations and the law's standards for reclamation. Further, it is clear from the superb reclamation record the mine's employees already have established that the mine will succeed in its plans if granted the requested permit to continue operating.

It is unfortunate that some Montanans still equate hard rock mining with the historic, pre-regulatory activities that have left behind pollution problems and, too often, severe visual impacts as well. As I know you and your colleagues understand, modern, regulated mining activities are quite different, not only because we now have laws that require environmental protection, but also because modern mining technologies are so much better than in the past. With House Bill 330 in 1995, I sought to further distinguish modern mining from the historic activities and impacts Montana knows so well.

My amendments to the metal mine reclamation law ensures that no subsequently-permitted metal mine will ever again leave behind a site that causes negative impacts to Montana air or water quality. The amendment also ensures that no metal mine will ever again leave behind an open pit where rock faces and pit walls are structurally unstable or dangerous to wildlife or humans in any way.

Response to Letter 11

Letter 11 Continued

As expected and required, Golden Sunlight plans to meet these new, minimum reclamation requirements. But the mine also plans to do far more than necessarily required.

As an additional set of ideal goals for metal mine reclamation, my amendment specifies that "if feasible" mines are to reclaim their sites so as to restore them to a pre-mining functional use and to make them blend unobtrusively with their natural, pre-existing surroundings.

Again, Golden Sunlight plans not only to fulfill these ideal requirements but also to do better. Already, employees have steadily improved the productivity of the wildlife habitat that surrounds the mine. They have even worked closely with the Department of Fish, Wildlife and Parks in the planting of wild turkeys near the mine, and the turkey population has since grown to the point where the agency has been able to issue new hunting permits in the area. The mine's permit proposal includes detailed plans for achieving the same standard -- habitat better than when modern mining began -- once reclamation is completed at the mine site itself. This clearly exceeds the Legislature's ideal goal of merely restoring a functional use such as habitat, recreation or grazing.

In addition, Golden Sunlight plans to exceed the ideal goal of reclaiming the site so that it will blend with surrounding areas. The mine's reclamation efforts not only will get the mine site to "blend" with the surroundings but will eventually leave the visual impacts of the mine all but invisible. And again, the mine's employees already have demonstrated the ability to achieve this goal. They have worked consistently to experiment and refine new approaches to reclamation on their site -- they've even developed and patented new equipment for this -- and, as a result, have created a new model for reclamation that I am told is now being applied to other mining sites in the region.

Like a golf course, a homesite, or a highway right-of-way, a mine in my view represents a beneficial use of appropriate landscapes. Mining provides some of the best jobs Montana has to offer, along with spending on goods and services that supports hundreds of non-mining jobs, and sizeable contributions to the tax base that benefit all Montanans. The purpose of the Legislature's amendments to the reclamation law is to support the ability of mining to exist, while also guaranteeing that our environment is protected and that post-mining productivity and aesthetics are maximized to the extent possible. Frankly, I am excited to see that Golden Sunlight offers the technical skill and determined commitment to do even better than this.

Finally, I would like to address the notions that some environmental activists have expressed on the subject of backfilling the pit at Golden Sunlight. I want to make clear that I view their rhetoric as seriously misleading to the public in a way that discourages rational and honest discussion and sensible decision-making.

11-1 The Legislature never envisioned that a metal mine should be required, in effect, to "put a mountain back" after mining is completed. This is true for several reasons. First, we all should understand that metal mining, unlike coal mining for example, involves a process of steadily improving technologies that can make former mining sites economically viable over and over again. This is one reason Golden Sunlight as well as many other currently operating mines exist overtop the same sites mined by our forefathers. Backfilling directly contradicts this, and actually

Response to Letter 11

11-1 Comment noted. Please see the Responses to Comments 16-37 and 23-5.

76

Letter 11 Continued

11-1 maximizes the risk that a site will never again be able to be put to this beneficial use. Second, backfilling, even to a partial extent, is not always necessary to achieve the overriding goal of protecting the environment and, if possible, restoring non-mining productivity and aesthetic quality. Golden Sunlight exemplifies this fact, as well as the more important reality that backfilling doesn't necessarily create additional environmental benefits of significance. The analysis of this subject in the Golden Sunlight DEIS makes this plain. When backfilling risks that future mining would be cost-prohibitive, and when it wouldn't create extra environmental benefits of consequence, requiring backfill becomes a clear absurdity that runs counter to the public interest in providing good jobs and other economic values that are compatible with environmental protection.

I have been proud to represent in the Legislature many of the good men and women who work at Golden Sunlight, as well as many other Montanans who support and appreciate their work. These are people who have clearly demonstrated their constant commitment to precisely the blend of environmental consciousness and economic productivity that all of us should value and support.

These people also have lived far too long with the stress and strain of not being sure how long their jobs will last, largely because of unfair and inaccurate attacks by those who are opposed to mining no matter how environmentally responsible it is. Golden Sunlight's employees literally are creating a new, improved standard for their industry, and they clearly deserve the permit they have spent nearly a decade to obtain.

Thank-you for taking the time to consider my views in your public involvement process. I know from my experience that I speak for many others.

Sincerely,

Duane Grimes

Rep. Duane Grimes

cc: Mr. Mark Simonich
Governor Marc Racicot

Response to Letter 11

Letter 12

The Big Sky Country

MONTANA HOUSE OF REPRESENTATIVES

[illegible]
[illegible]

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[illegible]
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January 19, 1998

RECEIVED
JAN 21 1998
MT DEPT OF ENV QUALITY
PERMITTING & COMPLIANCE DIV.

Mr. Greg Hallsten
Montana Department of Environmental Quality
PO Box 200901
Helena, Montana 59620-0901

Re: Golden Sunlight Mine DEIS

Dear Mr. Hallsten:

When I heard that no one spoke in opposition to Golden Sunlight Mine at your recent public hearing, I called a number of folks, including the mine's managers, to refresh my memory on the operation's permit application and the mine's uniqueness. After all, I can think of no other current metal mine permit process that hasn't attracted steady and loudly vocal opposition, from no matter how small a minority of Montanans.

My recollections turned out to be accurate.

Golden Sunlight clearly deserves the widespread support it is receiving from its immediate neighbors and surrounding communities. The mine's employees have consistently, and successfully, dedicated themselves to the goal of setting new records for reclamation success and environmental protection more generally, while also contributing greatly to our state's economy.

I support Golden Sunlight's proposal, and I hope your agency will complete the EIS process and issue the requested permits in a timely manner. It is crucially important to both our economy and to the well-being of hundreds of Montana families (not to mention all of Jefferson County) that Golden Sunlight be able to continue operating without interruption.

I am well aware of ongoing concerns about the sufficiency of reclamation capabilities at other mine sites in Montana, and I have no doubt but that MDEQ will ensure these responsibilities are fully addressed (if not, I can assure you that my colleagues and I will lead the charge at the next session of the Legislature to ensure that reclamation concerns are addressed satisfactorily). But the Golden Sunlight Mine is unique in this regard, and the quality of the mine's reclamation record and its detailed reclamation plan for the future deserve special emphasis and recognition. In its years of operation so far, Golden Sunlight has researched and perfected improved reclamation

Letter 12 Continued

techniques that have become the state-of-the-art model for other sites in the region. Most important, Golden Sunlight plans not merely to meet Montana's new reclamation requirements, but to exceed them in various ways. The mine's employees have proven that they deserve the opportunity to demonstrate to all Montanans how modern mining can set itself completely apart from the historic, unregulated activities to which most of us still react negatively.

12-1 I have seen indications in recent news reports that some environmental extremists may use as an excuse to oppose Golden Sunlight their theory that MDEQ's application of the Legislature's 1995 amendments to the Metal Mine Reclamation Act was inadequate in the case of the Golden Sunlight EIS. I disagree. The Act specifies requirements as well as goals that are to be required "if feasible." The requirements, which apply to all mines regardless of their circumstances, ensure that no subsequently-permitted mine can threaten environmental quality. In contrast, the goals, to be required only when feasible, seek to minimize and even erase the visual and land-productivity effects of mining to the maximum extent possible. The Legislature carefully defined a series of criteria to enable the agency to appropriately measure this question of feasibility. I believe these criteria developed by the Legislature give your agency all the guidance it needs, applicable to all mining circumstances (which, as we know, can vary widely, from site to site), and that these criteria ensure that permit requirements will fairly balance the public interest in allowing mining to occur, both now and in the future, along with the public interest in requiring things only when they will make a net positive difference in environmental quality. As you may recall, the 1995 strengthening amendments to the Metal Mine Reclamation Act did not direct the agency to conduct rule-making, because the amendments themselves were clear and designed to be fully implementable as passed by the Legislature.

In any event, this whole subject strikes me as clearly irrelevant in the case of Golden Sunlight, as the mine's proposal meets all the Legislature's goals, even the ones that are only required when feasible. In fact, it seems clear to me, as I've already stated, that the mine's employees have developed a reclamation plan that goes beyond the Legislature's expectations. The mine plans to reclaim the site to a condition where wildlife habitat is actually better than it was before mining began, just as employees have already achieved this remarkable accomplishment on lands adjacent to the mine.

I urge MDEQ to issue a permit to allow Golden Sunlight to continue operating. As I read the numbers, doing so will allow the mine to spend another $60 million-plus on employee salaries, over $21 million in taxes, and to spend over $146 million in Montana alone, in purchases from other businesses in the state. Montana cannot afford to deny this kind of economic contribution, especially not when it comes hand-in-hand with superior environmental performance.

Sincerely,

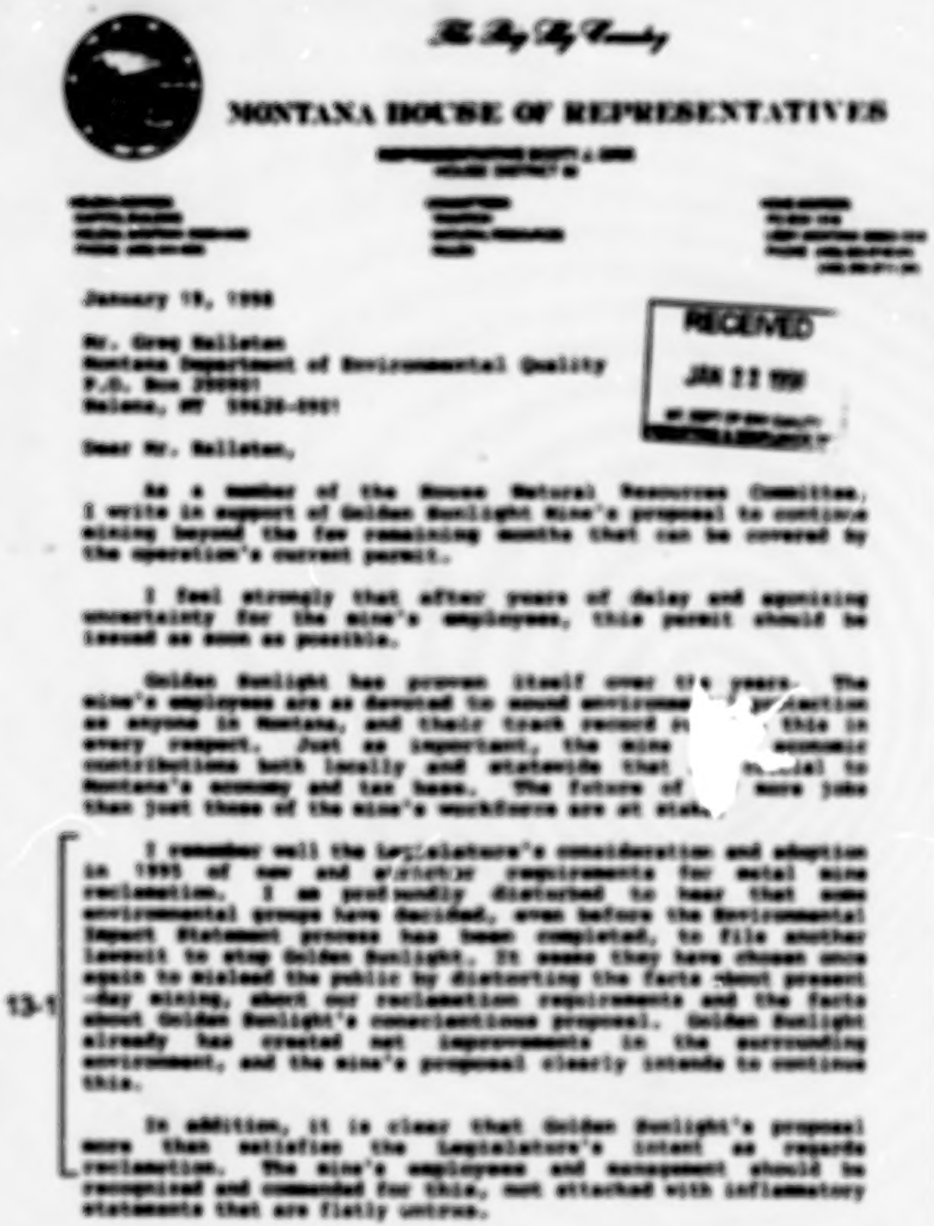
Larry

Rep. Larry Grinde

Response to Letter 12

12-1 Comment noted. Please see the Responses to Comments 16-37 and 23-5.

Letter 13



The Big Sky Country

MONTANA HOUSE OF REPRESENTATIVES

January 19, 1998

RECEIVED
JAN 22 1998

Mr. Greg Hallsten
Montana Department of Environmental Quality
P.O. Box 200901
Helena, MT 59620-0901

Dear Mr. Hallsten,

As a member of the House Natural Resources Committee, I write in support of Golden Sunlight Mine's proposal to continue mining beyond the few remaining months that can be covered by the operation's current permit.

I feel strongly that after years of delay and agonizing uncertainty for the mine's employees, this permit should be issued as soon as possible.

Golden Sunlight has proven itself over the years. The mine's employees are as devoted to sound environmen[illegible] protection as anyone in Montana, and their track record su[illegible] this in every respect. Just as important, the mine [illegible] economic contributions both locally and statewide that [illegible]cial to Montana's economy and tax base. The future of [illegible] more jobs than just those of the mine's workforce are at stake.

13-1 I remember well the Legislature's consideration and adoption in 1995 of new and stricter requirements for metal mine reclamation. I am profoundly disturbed to hear that some environmental groups have decided, even before the Environmental Impact Statement process has been completed, to file another lawsuit to stop Golden Sunlight. It seems they have chosen once again to mislead the public by distorting the facts about present-day mining, about our reclamation requirements and the facts about Golden Sunlight's conscientious proposal. Golden Sunlight already has created net improvements in the surrounding environment, and the mine's proposal clearly intends to continue this.

In addition, it is clear that Golden Sunlight's proposal more than satisfies the Legislature's intent as regards reclamation. The mine's employees and management should be recognized and commended for this, not attacked with inflammatory statements that are flatly untrue.

Response to Letter 13

13-1 Comment noted. Please see the Responses to Comments 16-27 and 23-5.

8d

Letter 13 Continued

The Big Sky Country

MONTANA HOUSE OF REPRESENTATIVES

[illegible]
[illegible]

[illegible]

[illegible]

[illegible]

I support your Environmental Impact Statement's preferred alternative, and I hope to see a final permitting decision that allows Golden Sunlight to continue operating without interruption. After the thorough analyses the Montana DEQ has conducted, such a positive decision will be both justified and in the best interests of all Montanans.

Sincerely,

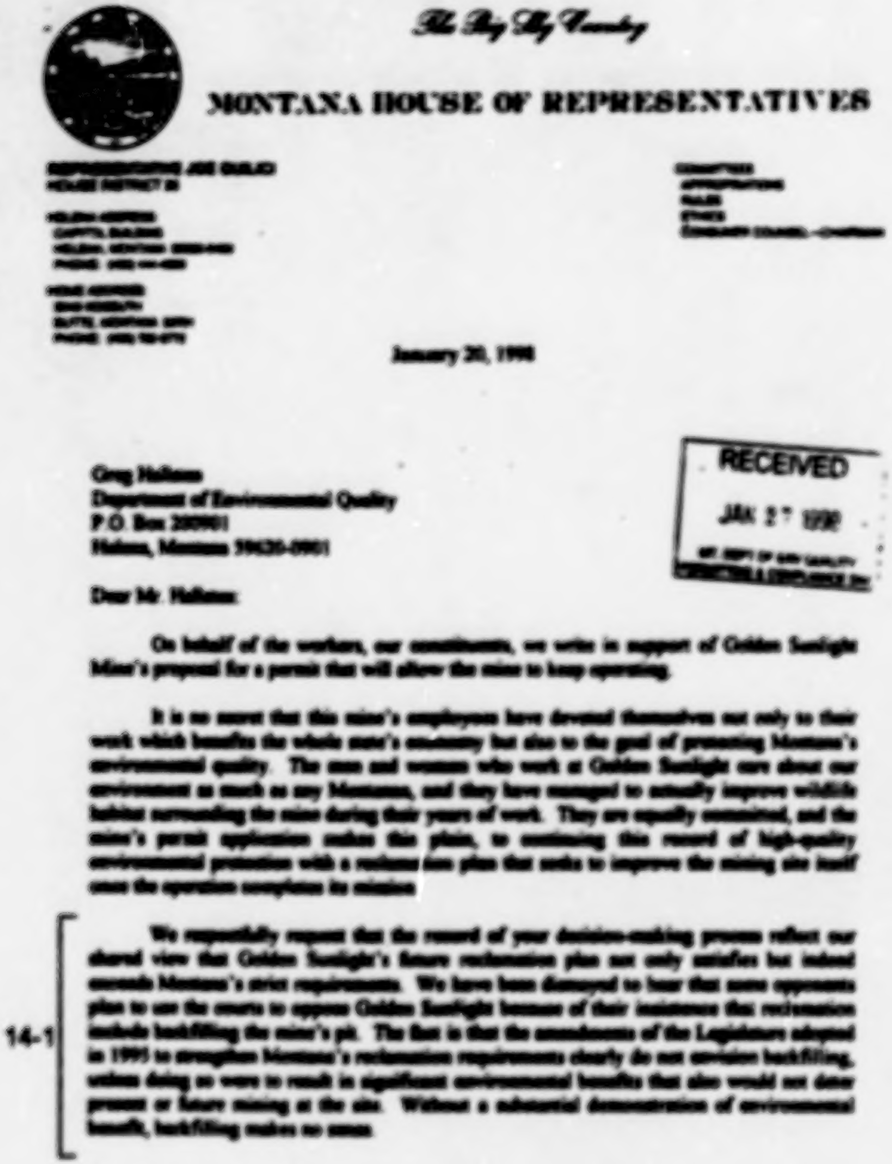
Scott J. Orr

cc: Director Mark Simonich, DEQ

SJO/rdq

Response to Letter 13

Letter 14



The Big Sky Country

MONTANA HOUSE OF REPRESENTATIVES

[illegible]

[illegible]

[illegible]

January 20, 1998

RECEIVED
JAN 27 1998
[illegible]

Greg Hallsten
Department of Environmental Quality
P.O. Box 200901
Helena, Montana 59620-0901

Dear Mr. Hallsten:

On behalf of the workers, our constituents, we write in support of Golden Sunlight Mine's proposal for a permit that will allow the mine to keep operating.

It is no secret that this mine's employees have devoted themselves not only to their work which benefits the whole state's economy but also to the goal of protecting Montana's environmental quality. The men and women who work at Golden Sunlight care about our environment as much as any Montanan, and they have managed to actually improve wildlife habitat surrounding the mine during their years of work. They are equally committed, and the mine's permit application makes this plain, to continuing this record of high-quality environmental protection with a reclamation plan that seeks to improve the mining site itself once the operation completes its mission.

14-1 We respectfully request that the record of your decision-making process reflect our shared view that Golden Sunlight's future reclamation plan not only satisfies but indeed exceeds Montana's strict requirements. We have been dismayed to hear that some opponents plan to use the courts to oppose Golden Sunlight because of their insistence that reclamation include backfilling the mine's pit. The fact is that the amendments of the Legislature adopted in 1995 to strengthen Montana's reclamation requirements clearly do not envision backfilling, unless doing so were to result in significant environmental benefits that also would not deter present or future mining at the site. Without a substantial demonstration of environmental benefit, backfilling makes no sense.

Response to Letter 14

14-1 Comment noted. Please see the Responses to Comments 16-37 and 23-5.

Letter 14 Continued

January 20, 1998
Page two

The Draft Environmental Impact Statement (DEIS) rejects the backfill alternative, and we agree with this conclusion. Golden Sunlight's proposal would leave the site in better condition, with better wildlife habitat, than existed before modern mining began. Such an accomplishment that also produces good jobs, millions of dollars in in-state spending every year and sizeable contributions to Montana's tax base, should proceed for as long as the ore body and mining technology can allow.

We support granting a new permit to Golden Sunlight Mines, and we hope such a permit will be granted in time to allow these jobs to continue without interruption.

Sincerely,

Senator J.D. Lynch

Representative Dan Harrington

Senator Bea McCarthy

Representative Red Menahan

Senator Debbie Shea

Representative Bob Pavlovich

Representative Joe Quilici

Representative Haley Beaudry

Response to Letter 14

Letter 15

BUTTE-SILVER BOW
OFFICE OF CHIEF EXECUTIVE
COURTHOUSE
BUTTE, MONTANA 59701

AREA CODE 406
PHONE [illegible]

RECEIVED
JAN 06 1998
MT DEPT OF ENV QUALITY
[illegible]

January 5, 1998

Mr. Greg Hallsten
Department of Environmental Quality
P.O. Box 200901
Helena, MT 59620-0901

Mr. Dave Williams
Bureau of Land Management
P.O. Box 3388
Butte, MT 59702

Dear Mr. Hallsten and Mr. Williams:

I am writing this letter to provide my thoughts and input on the Draft *Environmental Impact Statement* (DEIS) of Golden Sunlight Mine's proposed expansion. I had intended to testify in person at this evening's public hearing in Whitehall. However, due to a death in the family last night, I cannot attend, so I am sending this letter instead to highlight the points I would have made.

As the Chief Executive of Butte-Silver Bow, I have watched the mine's development closely over the years. Clearly, the mine is a major part of the economy in our area. The mineworkers are part of our community and I am keenly interested in their livelihood.

I have met with the managers of the mine several times. I have toured the facility to familiarize myself with the current operations and was fully briefed when the mine experienced ground stabilization problems in the past. More recently, I have reviewed the mine's expansion plan and the associated DEIS to evaluate the impacts of that expansion.

In my association with the Golden Sunlight Mine and its owners, I have been very impressed with the quality of their operation. I have observed an exemplary level of stewardship for both the environment and their workforce. The operators know their business and have always exhibited a great respect for the land in managing their reclamation responsibilities. For example, their investments in nearby ranches to create open space and wildlife habitat in the area speaks well for the integrity of this company. Their nomination and 2nd place finish in receiving the DuPont Environmental Award is an indication that this firm is a leader in its field.

When problems have occurred, like the ground shifting, the operators have responded in a direct and timely fashion. They have kept our government and citizens well informed about what was happening. There was no cover-up. They addressed their environmental impacts in a professional manner and made sure things were safe. Most impressive to me during their period of non-production associated with this problem was they still kept all their employees on board.

Response to Letter 15

Thank you for your letter. No response necessary.

Letter 15 Continued

January 5, 1998
Page two

Their commitment to sound reclamation and to their workers shows a sincere, stable approach to doing business, even in the boom and bust business of hard rock mining. The Golden Sunlight Mine has built a solid reputation and a level of trust in our community and these characteristics translate into my support for their expansion plan.

With regard to the DEIS, I am not an engineer or scientist, so I cannot offer specific technical comments. However, it does appear that the documents are very thorough and comprehensive. I think the operators have drafted a solid management plan to guide their expansion and address the environmental impacts. They have committed to a rigorous reclamation plan, and coupled with the mine's adjacent land acquisitions, the post-mining land use for the area should provide long-term benefits.

From my layman's view, I have two final points. One, I am not convinced that backfilling the pit is necessary. I would ask that you consider the alternatives before forcing the mine to implement this costly measure, which may jeopardize the economic viability of the expansion. I also think there may be advantages to the open pit in terms of wildlife habitat. Secondly, I would urge you to move as quickly as possible in your review of the DEIS and finalize a decision.

Again, I regret that I will not be able to attend the public hearing and present my input in person. Please accept these comments and keep me informed of the process as it moves along.

Sincerely,

Jack Lynch

Jack Lynch
Chief Executive

JL/am

Response to Letter 15

Letter 16

January 20, 1998

RECEIVED
JAN 22 1998
MT DEPT OF ENV QUALITY
PERMITTING & COMPLIANCE DIV.

Montana Department of Environmental Quality
Impact Assessment Bureau
PO Box 200901
Helena, MT 59620-0901
Attn: Greg Hallsten

and

Bureau of Land Management
Headwaters Resource Area
PO Box 3388
Butte, MT 59702
Attn: David Williams

Re: Comments on Golden Sunlight Mine DEIS

Dear Montana Department of Environmental Quality and Bureau of Land Management:

Please find the attached comments on the Golden Sunlight Mine DEIS developed on behalf of the Gallatin Wildlife Association, the Mineral Policy Center, the Montana Environmental Information Center, the National Wildlife Federation, and the Sierra Club. The comments are based on a review of the Montana First Judicial Court Memorandum and Order (Cause No CDV-92-486), and the Draft Golden Sunlight Mine EIS Volume I and II.

The comments are contained in the following sections: 1.0, Impacts From Waste Rock Dump Slopes; 2.0, Impacts From Acid Rock Drainage; 3.0 Impacts Associated with Perpetual Waste Water Treatment; 4.0 Pit Backfilling Feasibility; and, 5.0 Other Issues. Each section contains background information in the form of relevant excerpts from the Order and DEIS, followed by questions, comments and recommendations.

After you have reviewed these comments, I would be pleased to consider any comments or questions you might have.

Sincerely yours,

James R. Kuipers, P.E.

J. KUIPERS ENGINEERING P.O. BOX 113 • BUTTE, MT 59703 • PHONE (406) 782-5344

Letter 16 Continued

Comments on Golden Sunlight Mine DEIS

Developed by J. Kuipers Engineering on behalf of:

The Gallatin Wildlife Association, the Mineral Policy Center,
the Montana Environmental Information Center, the Sierra Club,
and the National Wildlife Federation

1.0 Impacts From Waste Rock Dump Slopes

Memorandum and Order

With regard to MEPA, the Memorandum and Order (MO) addresses Waste Rock Dump Reclamation by quoting the Department of State Lands (MDSL) as stating in the environmental assessment that: "The scale of this operation in conjunction with the proposed reclamation of steep slopes and the reactive nature of the waste materials adds new dimensions to an already large reclamation undertaking. The success of reclamation here is critical."[1]

Key aspects mentioned by the Court as being identified in the environmental assessment with respect to reclamation success were:

- Reducing the slope angle of the dumps. (3h:1v versus 2h:1v)
- Placing a "cap" layer of oxidized (non acid-forming) waste rock over the unoxidized (acid-forming) waste rock.
- Adding lime to further neutralize the oxidized rock cap.
- Replacing soils and revegetation.

The Court also cites a memorandum to the Hard Rock Bureau Chief Sandi Olsen, the Bureau's technical staff wrote concerning reclamation success that says: "Both the Hard Rock Bureau technical staff and the Bureau of Land Management have been uniform in their reasoning and documentation in support of at least 2h:1v slopes. To permit by "last-ditch" permitting, would not be reasonable representation of both industry and public interests. The environmental consequences and potential costs to the State of Montana for failed reclamation on these expensive, acidic dumps will be exponentially greater than if reasonable reclamation is required and conducted on the initial effort by Golden Sunlight."[2]

The MO goes on to quote the final EA, which states: "......soil loss on 2h:1v slopes could not be reduced to levels presumed acceptable......" and "Development of the oxidation reaction could progress slowly after reclamation is implemented, thereby delaying the acidification of the soil cover and development of acid mine drainage until years after the final reclamation is completed."[3]

The MO goes on to cite the Ninth Circuit which held that the practice of approving now and asking questions later is "precisely the type of environmentally blind decision-making NEPA was designed to avoid." The Montana First Judicial District Court concluded that "DSL's failure to further evaluate the environmental consequences of 2h:1v slope reclamation in an EIS, prior to sanctioning to use, was arbitrary and capricious."[5]

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[1] Montana First Judicial Court, NWF et al vs MDSL/DSL, Cause No. CDV-92-486 Memorandum and Order (1994), p. 21.

[2] Ibid. p. 22-23

[3] Ibid. p. 24-25

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DEIS

Potential Impacts

The introductory discussion of the potential impacts of MDEQ's approval of 3:1 slopes in Section I.B.2.a. Potential Impacts from Waste Rock Dump Slopes Constructed and Reclaimed at a Slope Angle Ratio of 2 Horizontal to 1 Vertical (2:1) says:

> "Studies conducted by GSM from 1991 to 1994 to implement stipulations 2,5,6,7, and 8 showed that soil erosion rates remained in the acceptable range (less than 2.0 tons per acre) when high coarse rock fragment content soil material (50 percent coarse fragments by volume) was used in combination with the oxidized waste rock cap, and additional erosion control, revegetation, and quality control measures proposed by GSM (contour benching, dozer gouging, mulching, intensive material sampling, etc.). Under the climatic conditions existing at the mine site from 1991 to 1994, vegetation cover established on reclaimed 2:1 and 3:1 waste rock dumps exceeded the cover on established reference areas adjacent to the mine. It must be noted, however, that during 1993, 1994 and 1995 the mine received above average precipitation that enhanced revegetation of the reclaimed slopes."[6]

In Section I.B.1.a. Current Mining Operations, Waste Rock Dump Reclamation - Waste Rock Dump Revegetation and Monitoring the DEIS says: "GSM has committed to keeping erosion below 2 tons per acre per year after successful vegetation establishment using a visual analysis and comparison with native reference areas." "Revegetation progress is monitored annually by measuring canopy coverage on revegetated slopes in comparison with reference communities."[7] In the following section Standards for Successful Revegetation - Revegetation it says "In order to achieve reclamation "success," canopy coverage must be at least 90 percent of canopy coverage in reference communities."[8]

The DEIS goes into a lengthy discussion in Section II.C.1.a. Reclamation (Revegetation) Considerations which includes the following:

2:1 Versus 3:1 Slope Angle Revegetation Success Potentials

> "GSM proposes to reclaim waste rock dump slopes at both 2:1 and 3:1 slope angles, with the majority consisting of 2:1 slopes. GSM emphasizes the 2:1 slope angle . . . . for a variety of reasons." "MDEQ's preference for 3:1 slopes was based on the widely held premise that flatter slopes exhibit higher revegetation potentials due to lower potential erosion rates, enhanced equipment access/efficiency/safety factors, and greater precipitation infiltration leading to a more plant-amenable soil moisture regime. The results of . . . . modeling analyses indicated that 3:1 slope angles are less susceptible to erosion than 2:1 slopes, given assumed site-specific conditions."

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[5] Ibid, p. 26 ff.

[6] United States Department of Interior and State of Montana, Volume I, Draft Environmental Impact Statement, Golden Sunlight Mine, (1997), p. 15.

[7] Ibid, p. 54.

[8] Ibid, p. 60.

Letter 16 Continued

Comments on Golden Sunlight Mine DEIS - Page 4

"Application of high coarse fragment content soil material . . . . . results in acceptable potential erosion rates . . . . . Potential erosion rates are 1.8 and 1.2 tons per acre per year for the 1- and 5-year time frames respectively, on 2:1 slopes. The values for 3:1 slopes are 1.1 and 0.8 tons per acre per year for the same time frames. Application of low coarse fragment content soils results in a notably different situation. The potential erosion rates for 2:1 slopes under this soil replacement scenario are 7.2 and 9.6 tons per acre per year for the 1- and 5- year time frames respectively. For 3:1 slopes, these values are 4.5 and 5.0 tons per acre per year. This analysis underscores the value of the application of high coarse fragment content soils as armoring to reduce the potential for erosion, particularly on 2:1 slopes."

"It can, therefore, be proposed that adequate soil coarse fragment contents are present on the soils on the western side of the project area, given a very broad range of assumptions." "There does not appear to be a compelling advantage to requiring 3:1 dump slopes . . . . ." "although, it was found that erosive power is greater on 2:1 as compared to 3:1 slopes . . . ." "The question of revegetation cover production under below average precipitation conditions remains. . . . . Increased runoff will limit to some degree the amount of precipitation that will enter the soil and be available to plants for establishment and growth on 2:1, as compared to 3:1 slope angles."

"In summary, it may be concluded that either 2:1, 3:1, or any combination of these slope angles can be successfully reclaimed given the use of a applicable sequence of proven reclamation techniques and attention to detail. . . . . In the absence of these techniques, it cannot be concluded, particularly on 2:1 slopes, that revegetation will attain the level of success shown on the test plots. At this point it must be concluded that steep slope revegetation success at the Golden Sunlight Mine site is questionable and may not achieve the goals set for the project."[5]

Questions/Comments

16-1 1. Soil erosion rates were not actually measured as inferred in the DEIS, but rather were only modeled. The 2.0 tons per acre erosion standard, because it is based on modeling, is theoretical and does not have the same value as a standard which could be empirically measured by observation or experience for success.

16-2 2. The vegetative canopy data is obviously biased, given the critical aspect of precipitation. Fundamental scientific reasoning dictates that meaningful analysis of the results can be assessed only if a full range of the expected weather conditions has been met. The reclamation test-plots are an experiment in-progress. Decisions as to the efficacy of 2:1 slopes should be made on proven and accepted information only.

16-3 3. Initial vegetative canopy growth is typically enhanced over long-term canopy growth due to ground preparation, mulch, fertilizers, seed density, etc.... It may also be biased by the seed mix. It will substantially decrease over time if soil cover is lost, the nutritive value of the soil changes, or climactic conditions change unfavorably.

16-4 4. Mitigation measures 5-4 and 5-5, were developed to address the potential for failure of 2:1 slopes. Undefined "alternate erosion control techniques" and mulching are not proven to be technically feasible in correcting steep slope reclamation failures.

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[5] Ibid., p. 304-308

Response to Letter 16

16-1 Erosion rates were directly measured in the early stages of the test plot studies as cited on page 306 of the Draft EIS. Direct measurement of erosion rates in the field was discontinued due to data accuracy concerns. It should be noted that at the time measurements were discontinued, erosion rates from the reclaimed areas paralleled those of the Reference Areas. Text on page 306 of the Draft EIS has been modified to clarify that direct field measurements were initially made.

The MDEQ expects that erosion will occur in the initial years following planting at most disturbed areas undergoing revegetation. The 2.0 tons/acre/year standard was adopted by the MDEQ based on estimated rates of soil formation in the area within which this project is located. If soils develop at or below this rate naturally, then a soil loss at or below this rate is acceptable. Based on observations since erosion monitoring began, any erosion observable to field personnel is assumed to exceed the 2.0 tons/acre/year rate. With this type of standard, unacceptable erosion rates can be identified readily in the field and mitigation measures employed as a result.

This rate also compares favorably with the "soil loss tolerance" values developed by the Natural Resources Conservation Service, formerly the Soil Conservation Service (1993), based on soil depths and the properties of limiting subsurface layers. According to this source, a soil loss tolerance of from 2.0 to 4.0 tons/acre/year is acceptable for a soil depth of 20 to 40 inches existing over a subsurface layer exhibiting a variety of root-restricting limitations. The soil replacement depths proposed for all disturbed areas but the West Waste Rock Dump tops and haul roads fall into this category.

The proposed 19-inch replacement depth for the West Waste Rock Dump tops and haul roads fits into the high end of the 10- to 20-inch soil depth category cited by the NRCS. A soil loss tolerance of 2.0 to 3.0 tons per acre is acceptable for this category if the layer existing below the 19-inch depth does not impose a permanent layer of root limitation, a permanent loss to productivity in a given climate would not occur, and the situation can be overcome through natural or managed processes to achieve the same productivity of a non-eroded soil condition. Given that the 19 inches of replaced soil would be underlain with at least 2.0 feet of neutral capping, an erosion rate standard of 2.0 tons/acre appears to be acceptable for this site in all cases.

Citation:

U. S. D. A. Soil Conservation Service (Natural Resources Conservation Service). 1993. National Soil Survey Handbook, Title 430-VI. U.S. Government Printing Office. Washington, D.C. Various Pagings.

Response to Letter 16

16-2 It is true that annual precipitation rates more characteristic of normal would have been preferred during the term of the test plots to date. However, the test plots were constructed in a timely manner, with full awareness of the potential vagaries of climate. The data resulting from these plots is still of value and instructive with respect to the eventual fate of revegetation attempts on site under a variety of climatic, topographic, and edaphic conditions. In this regard, it should be noted that 1995 plant cover data measured on 2:1 and 3:1 slopes on the East Waste Rock Dump continues after four years to significantly exceed (50+ percent) that of the corresponding 2:1 Reference Area as discussed in the GSM 1995 Annual Report. It also should be noted that the total precipitation during 1995 equaled 13.42 inches, paralleling typical average annual precipitation conditions at the mine site.

Agency reclamation personnel note that successful revegetation has occurred in other areas under conditions of less than average annual precipitation. Though species diversity and dominance may vary under varying precipitation conditions, including years of lower than average rain and snowfall, no revegetation failures are known to have resulted solely from drought.

16-3 No data or literature are cited in this comment to support the conclusions presented. The adverse conditions described would apply to any vegetative community, whether reclaimed, agricultural, or native. None of these conditions are expected to be more likely to occur in reclaimed areas than other areas. The selected reclamation techniques are expected to provide adequate stability, erosion control and soil chemistry to ensure a favorable environment for plant growth.

The phrases "initial vegetative canopy growth" and "long-term canopy growth" are undefined in the comparative sense. Initial vegetative canopy growth could be enhanced over a more mature plant community under certain circumstances depending upon the definition of "initial." If it is assumed that this is true for the mine site, and it may not be, then the fact that the plant cover measured on the test plots is greater than the Reference Areas as noted in the Draft EIS would allow for a reduction of plant cover to Reference Area levels without an associated reduction in vegetation success potential.

With respect to the variables identified, the effects of typical "ground (assume "seedbed") preparation" techniques cease to have an effect on soil erodibility a few years following implementation. The major ground preparation activity, which occurs on the waste rock dump surfaces following soil placement is dozer gouging, which is somewhat similar to pitting. Pitting typically has an effective life of from 5 to 10 years. However, any ground preparation technique begins to lose its effectiveness immediately after initial application (Renard et al. 1992). Both straw and wood fiber mulch also have an effective life of approximately one year (Long et al. 1992). In terms of fertilization, it is much the same. Although there are residual fertilizer effects, fertilizer application rates are typically based on one growing season's needs.

Response to Letter 16

Given this information and the reasoning supplied in the comment, it would be expected that the major effects of these variables would be rendered void or at least less significant within one or two years following the initial planting of the test plots. As noted in the Draft EIS, vegetation cover was greater on the test plots following two (West Waste Rock Dump test plots) and three (East Waste Rock Dump test plots) growing seasons. The reduced effectiveness of the noted variables had not yet contributed to a "substantial decrease" in vegetative cover in the noted time frame. A review of more recent test plot plant cover data confirms these statements. Vegetation cover on the East Waste Rock Dump was again measured in 1996 and presented in the GSM Annual Report. The vegetation cover on both the 2:1 and 3:1 slopes again exceeded that of the applicable 2:1 Reference Area by approximately 50 + percent. Even in a year of near average precipitation (13.42 inches), four years following test plot planting, the comment-predicted decrease in soil cover has not occurred.

Whether or not a reduction in plant cover would occur over time, the comment ignores the central purpose of the revegetation techniques cited. One of the main reasons for employing these agronomic practices is to enhance the initial growth and vigor of a vegetation community such that the community can withstand negative edaphic, climatic, and other environmental impacts over time. This is the proper approach to enhancing the potential for revegetation success on the areas to be reclaimed.

The seed mixtures proposed for use contain perennial grass and forb species adapted to climatic and edaphic site conditions. If there is a bias in these mixtures, it is toward selecting the species most adapted to the site and most likely to produce effective vegetative cover; this is the most reasonable approach to achieving the revegetation goals set for this project.

The EIS process is clear in that a worst case scenario must be analyzed in the absence of data or information to the contrary. The fundamental concept of this comment is that a worst case scenario should be assumed because something negative could happen. The existing vegetation cover and associated test plot data allow for a reasoned analysis of impacts to revegetation potential and success. A worst-case default scenario is not warranted in this instance.

Citations:

Long, S. G., J. K. Burrell, N. M. Laurenson, and J. H. Nyenhuis. 1992. Manual of Revegetation Techniques. U.S.D.A. Forest Service. Equipment Development Center. Missoula, Montana. 145 pp.

Renard, K. G., G. R. Foster, G. A. Weesies, D. K. McCool, and D. C. Yoder. 1992. Predicting Soil Erosion by Water: A Guide to Conservation Planning with the Revised Universal Soil Loss Equation (RUSLE). Draft. U.S. Department of Agriculture. Washington, D.C. Various Pagings.

Response to Letter 16

16-4 Mitigation Measures S-4 and S-6 were not developed to address the potential for failure of 2:1 slopes. The measures were developed to ensure that GSM continues to employ revegetation techniques, which have resulted in the successful reclamation of both 2:1 and 2:1 slopes to date. Successful reclamation of regraded slopes has been dependent, in part, on the use of several specific soil handling and revegetation techniques. This array of techniques included the surficial replacement of high coarse fragment soils as well as mulching. The revegetation plan proposed by GSM, and included as a part of the documents supporting the Draft EIS, was reviewed prior to Draft EIS preparation. GSM had not directly committed to continued on-site use of these two techniques, which had been shown to be a necessary part of the slope reclamation program. Instead, it was inferred that other techniques equal in value would be employed to aid in successful slope reclamation. To be certain that "undefined" and untested techniques were not employed in lieu of those techniques of proven worth, Mitigation Measures S-4 and S-6 were developed.

It is true that undefined "alternate erosion control techniques" are referred to in S-4 as potentially applicable for use on site. This provision was included to allow GSM to evaluate and possibly employ other techniques in the future to achieve the reclamation goals of this project. However, the text of both mitigation measures clearly states that such alternate techniques could only be acceptable "if it can be shown that the substituted technique(s) will provide the same effect with regard to reducing erosion potentials" as the techniques currently employed.

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Letter 16 Continued

Comments on Golden Sunlight Mine DEIS - Page 5

Conclusions

16-5 The science of geomorphology focuses upon the character of the earth's land surface. Most geomorphologists agree that under natural conditions, there exists a balance, described as equilibrium or steady-state, between geomorphic processes and landforms. Stability does not lead to a progression toward a new equilibrium or steady state, but a return to the previous state. The goal of reclamation is clearly the re-establishment of a steady state.

In the simplest terms with respect to mine dump reclamation this means forming a stable landform and propagating soils and vegetation such that soil erosion is in equilibrium with the rate of soil formation. It is absolutely clear from the information presented, and the experience of the vast majority of operations in mining reclamation, that slopes of 3:1 or greater best achieve this goal.

To not show preference for the 3:1 slope alternative flies in the face of fundamental technical and general reasoning, and based on the evidence given, should be considered fundamentally suspect from a scientific standpoint. Given the importance of a long-term solution represented by an effective cap (clean waste, soil and vegetation) over the high ARD potential waste rock, the significantly increased potential for failure of 2:1 slopes in the long-term, and the difficulty and expense in reconstructing failed slopes at some point in the future (particularly given loss of irreplaceable topsoil), 2:1 slopes should not be accepted by the agencies given that its efficacy has not been proven and the only real significant advantage is decreased cost to the company.

As stated in the Memorandum and Order, mine plan permitting is not responsible representation of both industry and public interests. From the public interest standpoint, the agencies have not demonstrated that 2:1 slopes will achieve the reclamation goals for the project, and in their own words the "revegetation success at the Golden Sunlight Mine site is questionable." Because the selection of 2:1 slopes appears to indicate strong industry bias within the agencies, it is recommended that the agencies rely upon a panel of objective experts, independent from either the agencies or proponent, to make such determination and provide a credible explanation for the final selection.

Ground Movement

As is widely known, GSM has a history of significant ground movement and other stability concerns as mentioned in the following sections of the DEIS:

I.A.2.c. Investigation of Ground Movement: 1994 - Ground movement detected in portions of pit, and beneath the mill and East Waste Rock Dump. Voluntarily suspended operations. "Movement occurred on a pre-existing failure plane as much as 300 feet below the surface. Movement was initiated by load created from the mine waste rock dumps."[9]

I.A.4. January 1995 to 1997 Interim Dump Plan: ". . . . stability concerns prohibited GSM from depositing waste rock in areas originally designed as waste rock dumps . . . ."[10]

II.A.2.c. Faulting and Seismicity: "These analyses indicated that although catastrophic failure of the waste rock dumps and buttresses would be unlikely under the design earthquake event, localized deformations varying from less than 1 to up to 7 to 8 feet

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[9] Text, p. 5.

[10] Text, p. 6.

Response to Letter 16

16-5 The agencies have agreed not to use one standard for slope angle. Each mine is site specific. The agencies looked at natural analogs in reviewing GSM's mine reclamation plans. 2:1 slopes are typical in the pre-mine area on the west and south sides of the mine area. The East Waste Rock Dump complex pre-mine slopes are largely 2:1 or less. The agencies have tried to match these natural slopes in the mine area.

Native reference areas and roadcuts on the northwest and south ends of the GSM mine area reveal that soils have developed on unconsolidated colluvial/residual parent materials on 2:1 slopes in the area. The soil parent materials contain large amounts of rock fragments, which have allowed the soils to develop on these steep slopes. Reclamation soil profiles must mimic these natural analogs to be successful.

The replaced soils on west and south 2:1 slopes at Golden Sunlight Mine would have been salvaged from undisturbed slopes that often exceeded 2:1. GSM is able to salvage soils on slopes up to 1.5:1 with their patented counterweights on the back of a bulldozer. The agencies would be more concerned with erosion on the west and south 2:1 slopes if soils salvaged from shallow slopes would be replaced on the steep slopes.

Erosion to date on the steep slopes has been limited to the sheet, rill and gully erosion typically seen during the establishment phase. This is not only typical but anticipated. GSM has had to go back in and patch these areas. The only other significant erosion to date has been the result of improper grade control on a road or bench that has created an area where water accumulated and overtopped, creating a source of water flowing over the face of a reclaimed waste rock dump. These areas have been corrected.

In summary, on 2:1 slopes, once the initial surface soil fines have eroded off the replaced soil surface during the vegetation establishment phase, and a rock armor surface has formed, erosion has been less than 2 tons/acre/year. The agencies have agreed that any visible erosion exceeds the 2 tons/acre/year standard.

On 2:1 slopes on the east side of GSM's mine area, the natural soils have less rock content and are more erodible. They also have more lime and produce a crust that can increase erosion especially during the vegetation establishment phase. In other words, the slope angle is not the only critical component in reducing long term erosion and reclamation success at GSM. Each site must be reviewed based on what is needed to reduce erosion to acceptable standards (i.e., less than 2 tons/acre/year). Mitigation Measures S-4 and S-5 were developed to ensure that tested reclamation measures are used by GSM (see Response to Comment 16-4). GSM could propose to use other techniques to reduce erosion to acceptable levels on any particular site. The agencies would allow GSM to reclaim with other techniques on any particular slope if it can be shown that the substituted technique(s) would provide the same effect with regard to reducing erosion potentials as the techniques currently employed. If erosion is not acceptable after the initial establishment phase, GSM must redo the work. Bond would not be released until erosion has been controlled.

Response to Letter 16

If erosion is controlled, the agencies consider revegetation considerations to be secondary. Canopy cover must compare with canopy cover on undisturbed reference areas. Reclamation experience over the last 25 years has shown that canopy cover is generally not a problem if soils are not chemically limiting. The seed mixes used at GSM are mixes of reclamation species used throughout the northern latitudes. The agencies have no reason to believe, based on over 20 years of reclamation research and experience, that the revegetated communities will fail if erosion is controlled.

Slope angle is just one parameter affecting reclamation success. A more critical factor is slope length. To help mitigate concerns raised by the public in comments on the Draft EIS, the agencies have decided to add an additional stipulation to reduce slope length from 200 to 100 vertical feet between benches (see Mitigation Measure S-7). This would reduce slope length to 225 feet on 2:1 slopes and 320 feet on 3:1 slopes. Slope length has been a parameter used by some of the federal agencies as a guideline. The agencies feel this is a reasonable and easy to implement mitigation that also will allow for additional access to maintain slopes if needed. This would apply to all slopes regardless of gradient. The currently reclaimed areas would not be changed unless erosion proves to be a future problem. Other measures can be added to existing reclaimed slopes such as additional surface rock mulches, rock breaks applied on slopes, etc. to produce the same effect as additional benches.

Letter 16 Continued

should be anticipated."

III.A.1.a. Geologic Impacts Associated with Discontinued Mining: "The most significant impacts that are associated with the geological resources are related to ground movements at the Golden Sunlight Mine and resulting impacts to the plant site buildings, existing pit, waste rock dumps, and tailings impoundments." The same section qualifies the static assessment in the DEIS with the following:

Potential for Earth Movements: "Lower static factors of safety also are allowed when more detailed geotechnical evaluation are conducted, thus increasing the confidence in interpretations of material strengths, subsurface geometry, and groundwater conditions," and "The seismic stability concern for earth slopes is not an issue of whether catastrophic failure might happen, but how much displacement might occur as a result of the earthquake."

Potential for Movement of Block Slips and Constructed Slopes: "The Midas Slump, a shallow landslide underlying the east dump area, was stabilized by waste rock buttressing in 1993." "Mining activities caused the Sunlight, Rattlesnake and Swimming Pool block slips to move 3.5 to 4 feet in April 1994." ". . . . . minor block slip movement occurred on the Rattlesnake Block between September and November 1996." "Under the No Action Alternative, additional waste rock will be placed at the toe of the Sunlight Block . . . will improve to 1.2 the static factor of safety against future shifting of the Sunlight Block. . . . The design incorporated the maximum amount of waste rock that could be safely utilized in the available permit area to improve the Sunlight Block stability. The interim buttress was reclaimed in the fall of 1996 at a slope of 3:1 to establish a minimum long-term static factor of safety of 1.3." "At this slope angle the long-term minimum factor of safety for the critical south face of the dump will be 1.2. . . . . The acceptance of a low, long-term factor of safety for the south face of the Interim East Waste Rock Dump was . . . ."

1. Use of worst-case assumption regarding the location of the weakest potential slip surface.
2. Use of worst-case assumption regarding the shear strength of the potential slip surface.
3. Relatively extensive geotechnical site investigation, ... provided a higher level of confidence as to the foundation conditions than is typical for most geotechnical designs. Higher factors of safety are used for designs based on less extensive investigation to compensate for unknown factors.
4. The low factor of safety was computed for a highly localized part of the dump.

"Seismic analyses indicate that large scale "failure" of the slope would not occur. However, acceleration and inertia-induced displacements could occur during the earthquake shaking . . . displacements of the Sunlight Block up to 8 feet are possible . . . ."

III.A.2.a. Geologic Impacts Associated with Continued Mining: Environmental Consequences: "Movement of the Sunlight or Rattlesnake Block Slips: The static factor of safety is improved from 1.2 to 1.3, but this does not substantially alter the environmental risks . . . . restricted movement would mitigate the consequences associated with

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Ibid., p. 130

Ibid., p. 235-236

Response to Letter 16

Letter 16 Continued

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movement of the Sunlight Block, but not enough to change the level of environmental consequences or reduce the likelihood categories." "These risks appear to be mostly related to disruption of the reclamation cover on the expanded East Waste Rock Dump which has the consequence of exposing limited volumes of ARD generating materials to surface infiltration."[12]

Finally, in Section IV.A.5.a. Geologic Impacts Associated with the 3:1 Slope Alternative: "Waste rock dump slopes that are reclaimed at 3:1 would be inherently more stable than the same slopes reclaimed at 2:1, in terms of mass slope stability."[13]

Questions/Comments

16-6 1. As the information indicates, significant deformations that could potentially impact the waste dump surfaces and other critical reclamation features are to be expected. However, no mitigation for such inevitabilities has been identified by the agencies in the DEIS. What mitigations are proposed for this significant and highly likely impact which will lead to both failure of the reclaimed slopes and increased ARD seepage? The final statement quoted strongly tends to support using 3:1 slopes as the appropriate and reasonable mitigation.

16-7 2. More evaluation does not necessarily correlate to the acceptability of a lower factor of safety, and in fact this may be contrary to fundamental engineering practice from a safety standpoint. More detailed evaluation should allow for a determination of a higher factor of safety. With more detailed evaluation, the conservatism necessary because of uncertainties is eliminated (typically more evaluation is performed in order to obtain a higher (or acceptable) factor of safety). If more evaluation results in a continued low factor of safety, then it only indicates the initial assumptions were correct. A lower factor of safety implies a higher risk. If the factor of safety does not change as a result of further evaluation, then neither does the risk.

16-8 3. Bonding for future reclamation assurances and groundwater treatment should take into account the inevitability of significant slope failures. This may also pertain to groundwater pumpback systems, piping to the water treatment plant, the water treatment plant, and any other critical structures needed "in perpetuity." How does the present bonding provide for such contingencies, particularly since their cost could be much more significant that the proposed mitigations?

Conclusions

16-9 As past experience at the site and analyses of future conditions indicate, ground movement is almost certain to have a significant long-term impact on reclamation success. Mitigation for this inevitability has not been identified in the DEIS. Mitigation's after the fact would likely be both impractical and expensive. Based on the inherent static stability of 3:1 slopes over 2:1 slopes, the 3:1 slope alternative is necessary as an absolute minimum, and given the site-specific nature of the GSM, even more stable slopes should be evaluated and considered.

Environmental Consequences

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[12] Ibid., p. 237-242.

[13] Ibid., p. 246.

Response to Letter 16

16-6 The inference that "significant deformation" is "expected" is not supported by the Failure Modes and Effects Analysis (FMEA) reported in Appendix H of the Draft EIS. The FMEA indicated that most of the identified modes of ground movement "failure" have a low (less than 1:100) to very low (less than 1:10,000) probability of occurring. This includes slope failures on the waste rock dumps for all alternatives. Moderately likely (1:10 to 1:100) failure modes are primarily associated with potential future movements of the preexisting, low-angle block slip (landslide) features. The only ground movements that are "expected" to occur are slope raveling of the pit walls, and consolidation settlement of the tailing impoundment surfaces. These movements will have negligible environmental consequences.

Mitigation for the moderately likely failure modes associated with block slip movements has already been performed by GSM through off-loading of waste rock materials near the head of the block slips, and waste rock buttressing in the toe area. Additional buttressing and mitigation would occur with continued mining. Monitoring, agency reporting, and action protocols have been developed for future slide block movements, as described under Mitigation Measure G-1 on page 375. Also, the mine has committed to regular inspections of reclaimed slopes, treating seeps, and repairing minor surface ruptures, both during the mine life and after closure. Even if movements which disrupt waste rock covers occurred, the probability for significant ARD generation is low given that repairs can be made quickly.

The fact that 3H:1V slopes are inherently more stable than 2H:1V slopes with regard to mass slope stability should not lead to the conclusions that 2H:1V slopes are unstable, nor that 3H:1V slopes are "necessary as an absolute minimum," as was stated in the conclusions of this series of comments (see Response to Comment 16-9). Flat ground is inherently more stable than sloping ground, but surely this does not lead to the conclusion that the waste rock dumps should be spread over large areas and leveled. The "absolute minimum" slope inclination for given geotechnical conditions is rationally defined by acceptable design criteria, usually as acceptable factors of safety against sliding. This was done in the geotechnical evaluations of slope stability at GSM, and is discussed in the Response to Comment 16-7.

The FMEA presented in Appendix H results in the conclusion that there is no discernable difference between the Proposed Action (Preferred Alternative) and the 3:1 Slope Alternative with respect to ground movement failure likelihood and environmental consequences. Therefore, the basis for selecting 3H:1V versus 2H:1V slopes should be criteria other than geotechnical factors of safety. These other considerations include the impacts of additional disturbance area with flatter slopes, the inclination of natural slopes in the area, scarcity of topsoil, and the reclamation success on 2H:1V slopes compared with 3H:1V slopes.

Response to Letter 16

16-7 Geotechnical engineers generally express the adequacy of predicted stability of a slope by a factor of safety. The factor of safety is the ratio between the shearing strength of the soil or rock along an assumed sliding surface, and the shearing force tending to produce the sliding. The lowest factor of safety for a given slope occurs along that potential sliding surface where geometry and strength combine to result in the lowest ratio of shearing strength to shearing force. A factor of safety equal to 1 implies that the shearing resistance and the sliding forces are just balanced. A factor of safety greater than 1 means that the slope is predicted to be stable with a margin of safety. How big this margin of safety needs to be usually depends on the consequences of failure. High hazard structures such as water retention dams are typically designed to have factors of safety on the order of 1.4 to 1.5.

However, it should be recognized that the probability of failure - or risk - may not be related directly to the computed factor of safety, but must be evaluated considering the uncertainty in the shear strength assumptions and other parameters, and the rigor or thoroughness of the analyses. A slope having a computed factor of safety of 1.5 based on overly optimistic shear strength assumptions or insufficient analyses may be less stable than a slope having a factor of safety of 1.2 based on conservative or extensively tested input data and comprehensive analyses.

The lowest factor of safety computed for reclaimed dump slopes under the Preferred Alternative was 1.3. This value was calculated for potential failure surfaces located on the south face of the East Waste Rock Dump where the slope geometry is unfavorable with respect to potentially weak, dipping beds in the foundation. This value of 1.3 is considered an acceptable design criterion by GSM's geotechnical consultants, and by the EIS contractor, because very conservative assumptions were used for the shear strength of the weak beds in the foundation. The degree of conservatism was assessed based on extensive site exploration and testing, knowledge of site geologic conditions, back-analysis of shear strength from the 1994 block slip movements, relevant published literature, and the extensive experience of the geotechnical engineers involved in this project. The fact that the slope is predicted to be stable under very conservative shear strength assumptions lends more confidence in a low probability of failure. Other slopes on the East Dump with more favorable foundation bedding plane orientations exhibit minimum factors of safety of 1.4 and 1.5, even under the conservative shear strength assumptions. The minimum factor of safety for reclaimed slopes on the West Waste Rock Dump is 1.7. These values are considered acceptable and conservative even for critical earth structures such as reservoir dams where failure would result in immediate loss of human life.

16-8 See Responses to Comments 16-6 and 16-7. The EIS analysis does not lead to the conclusion that significant slope failures are inevitable. Further, the proposed groundwater controls would not be at risk from slope failure, even if it were likely, because they are located on native ground away from the dump toes.

16-9 Please see Responses to Comments 16-6 and 16-7.

Letter 16 Continued

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According to Section 4.B.5. 3:1 Slope Alternative: "Total surface disturbance under the 3:1 Slope Alternative would be 3,078 acres (114 acres more than the Proposed Action.)"[8] and goes on to say in the following sections Waste Rock Impacts to Long-term Water Quality and Quantity: "As dumps are reclaimed, dump slopes would be reduced to 3:1. In general, milder gradients generate less runoff than steeper gradients. . . . The reduced slope may lessen erosion and thereby reduce sediment transport" ie., soil loss. "Water balance modeling results indicate seepage rate is not significantly affected by slope angle (assuming the proposed reclamation cover design)." And, Summary of Waste Rock Impacts to Water Quality and Quantity: "The groundwater recharge quality would be expected to experience greater ARD impacts sooner . . . . there could be increased quantities of ARD-containing surface waters from increased dump seepage . . . . However, these small incremental impacts are relatively insignificant when compared with all the other alternatives on the basis of ultimate concentrations and timing for metals impacts."

The cost is given in Section II.B.5. 3:1 Slope Alternative which says, "The additional cost for reducing slopes under the 3:1 Slope Alternative is estimated at $13,263,400, including $12,000,000 for regrading, $1,200,000 for soil stripping, and $63,400 for vegetation."[9]

Questions/Comments

16-10 1. In conjunction with the partial backfill alternative the 3:1 slope alternative would not result in any increase in acreage disturbed. Material removed for partial backfill would allow for a slope of 3:1 or less without additional disturbance.

16-11 2. The costs are for altering existing 2:1 slopes to 3:1 slopes. The costs would be significantly less if the material were deposited in the dumps with 3:1 slopes in mind. In the interim GSM has proceeded on the assumption of 2:1 slopes. The resulting costs should be considered a cost of GSM taking the risk that their proposal would be approved, and not as a direct cost against the alternative. If the alternative had been adequately considered beforehand, resulting in a determination of 3:1 slopes, the resulting cost would have been significantly less than indicated.

Conclusions

16-12 The disadvantages of the 3:1 slope are insignificant, and are far outweighed by the advantages in terms of slope stability and reclamation efficacy. The agencies hope that 2:1 slopes will decrease the potential for AMD from the waste dumps indicates that they are willing to compromise long-term reclamation success because they and the proponent have allowed an unacceptable situation to develop with respect to long-term AMD potential. The agencies should direct a solution directly at AMD (such as pit backfilling, neutralization, etc.,), rather than compromise reclamation success in hope that the blatant oversight leading to this situation might be "covered over" in the short-term. An objective independent panel should examine this issue, and determine the actions necessary to achieve both AMD and reclamation success, without unnecessarily compromising one for the other.

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[8] Ibid., p. 89

[9] Ibid., p. 384

Response to Letter 16

16-10 The agencies understand how the commentor concluded that 3:1 slopes would not disturb any additional acreage; however, this is not true. A combination of the Partial Backfill and 3:1 Slope Alternatives would still result in greater disturbance than the Proposed Action. GSM would need to obtain pit fill material from the dump tops on both east and west sides of the pit, close to the elevation of the pit area being filled. On the west side, material removed from the dump tops for pit filling could reduce the amount of footprint for a 3:1 slope. This is because the crest elevation of the dump would be lowered as material is removed for pit filling. As a result, there would be less material that would be pushed out onto undisturbed ground to create the 3:1 slope. On the east side, however, material removed from the dump for pit backfilling would not change the dump crest elevation. Therefore, the footprint for the 3:1 slope on the east would not change as a result of pit backfilling.

16-11 This comment is based on the erroneous assumption that GSM had already placed its waste rock with 2:1 final slopes in mind. The final slope angle actually has nothing to do with the way GSM constructs its waste rock dumps. GSM constructs its waste piles by dumping material from the top down, which results in an angle of repose slope before reclamation. For final reclamation, the angle of repose slope will be graded by pushing material down slope. With the exception of the 2:1 test plot areas, no slopes have been graded for reclamation that would need to be regraded before final reclamation to a 3:1 slope. In other words, no risk has been taken by GSM. The resulting extra cost of $13,263,400 calculated for the 3:1 slope reclamation was based on reclaiming a 1.4:1 angle of repose slope. Under the 3:1 Alternative, the excessive cost for reclaiming slopes to that angle would still be incurred regardless of the way GSM deposited its waste rock during previous dump construction.

16-12 The conclusions in the comment letter that 3:1 slope reclamation is more advantageous than 2:1 slope reclamation are based on the selected quotations used in the comment letter, which do not accurately portray the full discussion of 2:1 versus 3:1 slopes presented in the Draft EIS. When considering the Draft EIS analysis in its entirety, there is no compelling evidence to suggest a 3:1 slope outweighs a 2:1 slope in terms of reclamation success. Slope angle must be considered along with numerous other reclamation considerations. The agencies are convinced that 2:1 reclamation can succeed if designed properly. Slope angles of 3:1 do not guarantee success either. Reclamation of 2:1 slopes can succeed if soils used are taken from steep slopes, or the soils are amended to lessen the erosion potential. Water management also is critical. Slope length and control of runoff and runon moisture are all part of the design needs. Mitigation Measures S-4, S-5, and S-6 were developed to increase reclamation potentials. Mitigation Measure S-7 has been added to address slope length concerns. The agencies will hold the bond until reclamation of the slopes is successful whether they are 2:1 or 3:1.

Response to Letter 16

The purpose of the EIS is to provide an objective analysis of alternatives based on relevant information in the five-volume permit application and supporting technical documents. This information was reviewed and evaluated by technical experts with MDEQ, BLM, and the EIS contractor (and subcontractors) to obtain several independent technical perspectives on the key issues. In the case of dump slope reclamation, they determined there was sufficient technical evidence to support the use of 2:1 slopes where they occurred naturally on the landscape.

Letter 16 Continued

Response to Letter 16

2.3 Impacts From Acid Mine Drainage

Memorandum and Order

With regard to MEPA and acid mine drainage the MO cites that "Plaintiffs maintain that DSL has not adequately evaluated the potential for acid mine drainage. They point out that DSL has been unable to quantify the seepage that actually migrates out of the waste rock dumps, the tailings impoundments, or the pit itself. They also argue that DSL has not considered the effect of possible reclamation failure on the potential for acid mine drainage."

The Court goes on to cite several court cases wherein it was determined that "an agency must supply a convincing statement of reasons why potential impact are insignificant," and "an agency is further obliged to explain how these mitigation measures serve to reduce impacts below the level of significance," and that "A mere listing of mitigation measures is insufficient to qualify as the reasoned discussion required by MEPA."

The Court decided that "In this case, DSL has provided neither a convincing statement of reasons nor an adequate explanation of how the additional studies and mitigation measures contemplated by its stipulations render the potential environmental impacts of Golden Sunlight's reclamation plan insignificant."[11]

With regard to MEPA and issues surrounding long-term water quality and the pit lake the Court quoted the DSL in that "several of the Golden Sunlight's assumptions regarding groundwater flow are "not substantiated by data" and that the Golden Sunlight's inflow figures "could be low by an order of magnitude."[12] The plaintiffs contended that "although Golden Sunlight has committed to treating wastewater from the pit and tailings impoundments in perpetuity if necessary, DSL has violated MEPA by failing to evaluate the effectiveness, as well as the environmental impacts, of such a facility, which would be required to treat approximately 85 gallons of water every minute for the rest of time." The Court found that "For the same reasons that DSL's failure to prepare an EIS evaluating the impacts previously discussed was arbitrary and capricious, its failure to prepare an EIS to evaluate the environmental impacts associated with perpetual wastewater treatment was likewise arbitrary and capricious."[12]

With regard to the MMRA the court cites a discrepancy in the DSL's contention that "Seepage from the waste rock dump [sic] is not expected to violate state groundwater quality standards" by pointing out that in the same document "the agency concedes that "the actual amount of seepage into the groundwater tailings impoundments and pit is not know with any certainty." While the plan does provide for treatment of wastewater from the pit and tailings impoundments, no measures are provided to prevent seepage from these facilities . . . . . The Court does not understand how DSL can assure the public that water quality violations will not occur when it has little or no idea how much contaminated water might issue from these facilities."

The Court goes on to mention existing violations of groundwater quality standards by existing impoundment and waste rock dump seepage. The Court found "DSL's conclusion that Amendment 008 does not constitute a potential hazard to groundwater quality to be contradicted by information contained in the EA. The Court also finds that the reclamation plan, insofar as it neither provides a

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[11] Montana First Judicial Court, NWF et al vs MDSL/DSL, Cause No. CDV-93-486 Memorandum and Order (1994), p. 28-31.

[12] Ibid. p. 30-31.

Letter 16 Continued

reliable evaluation of the potential for groundwater contamination nor guards against such contamination, violates Section 82-4-336(8) MCA."[illegible]

DEIS

Potential Impacts

The introductory discussion of the potential impacts from mining in Section I.B.2.c. Potential Impacts to Surface and Groundwater Quality from Acid Mine Drainage (ARD) and Heavy Metals says:

> Waste Rock Dumps: "No impacts to surface water or groundwater quality are anticipated during active mining operations."[illegible]
>
> Tailings Impoundments: "The process of decommissioning Tailings Impoundment No. 1 began in 1993, and complete dewatering is expected to be completed in 8 to 10 years. Cyanide concentrations in the pumpback water are expected to decrease during the 10-year dewatering period." "Cyanide levels are no longer detectable in several downgradient private wells, indicating that the pumpback system has limited length, wildlife cyanide migration."
>
> "Under the current reclamation plan, the tailings impoundments will be reclaimed by dewatering, consolidation, grading, capping, and revegetating surfaces. Capping under the No Action Alternative will consist of 24 inch soil material cap on top of 18 inches of a clay liner on top of 24 inches of local borrow. Research on Tailings Impoundment No. 1 (Gelhar 1995) indicates the capping system does not exclude oxygen. Therefore, in time the tailings will acidify providing a potential for ARD.

No Action -	small to negligible infiltration -	little if any impact to groundwater anticipated once dewatering of the impoundments is complete.
Proposed Action - (no clay layer)	long-term infiltration 0.25"/year -	Seepage may be ARD and low quality in character, requiring groundwater pumpback system routed to water treatment (in perpetuity).

> "Localized failure (leaks) in the liner under Tailings Impoundment No. 2 are likely to occur over the long-term." Also "overall reduction of seepage with time, and anticipated impacts attributed to amount of tailings water that manages to seep through isolated leaks in the liner will be negligible."[illegible]

[illegible] Ibid., p. 38-21

[illegible] United States Department of Interior and State of Montana, Volume I, Draft Environmental Impact Statement, Golden Sunlight Mine, (1997), p. 15.

[illegible] Ibid., p. 16

Response to Letter 16

Letter 16 Continued

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Pg. "Because the pit will be maintained as a local groundwater sink after reclamation, and pit water will continue to be collected and routed to a treatment facility before being discharged, no impacts to groundwater quality are anticipated long-term."[12]

Questions/Comments

16-13 1. The statement that no impacts to groundwater and surface water quality is expected is contradicted by the evidence of "seepage of contaminated water from two of the waste rock dumps" (MD p. 27 Plaintiffs' Exhibit 6.) Is this, and is there other evidence seepage that would be expected to impact water quality?

16-14 2. Water infiltrating the Tailings Impoundments will have to go somewhere, regardless of the existence of a synthetic liner (as in TI 2). Seepage will result as either leakage through the liner, or it will result as seepage from the tailings (where it would be reclaimed if drain system works - see comments Section 6 - Tailings Impoundment Leakage). If drain system does not function properly, and leakage through liner does not exceed seepage infiltration rate, the seepage may daylight to the surface at some other (most likely downgradient) location.

16-15 3. With respect to the open pit, as a result of mining it now is necessary to change the direction of groundflow in perpetuity to prevent pit water from flowing out without treatment. Without some extraordinary measure, groundwater contamination (assumed significant) will occur as a result of the pit. How will the agencies ensure that the monitoring, pumping, water treatment, etc., given the wide range of both operational variables and economic factors? The estimates given for water treatment are essentially for an ideal case from both an operational and economic variable standpoint.

Conclusions/Recommendations

16-16 To reduce tailings ARD, DEIS should consider alternative disposal options for pyrite portion of tailings prior to commingling, either on site segregation in buried oxygen-free repository (bottom of pit) or off-site utilization. The most effective method of excluding oxygen is by inundating the pyritic material, which if successful causes acid production to virtually cease. This option, provided the proper conditions exist, would provide for optimum reclamation coincidental with partial or complete backfilling of the pit. This alternative is practical given that Section II.B.1.a. Current Mining Operations, Waste Rock Dumps and Buttresses says, "The STR circuit separates the gold-bearing sulfides from the sand portion of the tailings by gravity concentration . . . . "The pyrite-rich concentrate . . . . ." Following leaching, "The remaining pyrite-rich material is diverted to the tailings stream for disposal in the tailings impoundments."[13]

16-17 Another option for treatment of tailings ARD would be the use of paste tailings (sometimes referred to as dry tailings) to eliminate free water from pond (eliminates ponding, instability and infiltration (cyanide contamination)). Concurrent reclamation is facilitated with paste because the dewatered material is immediately compacted. Paste treatment eliminates segregation of fines and coarse layers, and slow consolidation zones. With the addition of cement paste would solidify the tailings in place forming an extremely high efficacy infiltration and erosion barrier and provide the needed ARD neutralization potential, eliminating the need for water treatment in perpetuity provision in the

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[12] Text, p. 17

[13] Text, p. 33

Response to Letter 16

16-13 The quotation in the comment is taken out of context. The actual statement referred to in the Draft EIS is that ..."No impacts to surface water or groundwater quality are anticipated during active mining operations." (Emphasis added). Based on analyses presented in Appendix J, impacts to groundwater are anticipated in the long-term, but not during operation of the mine. Surface water is managed during active mining through appropriate storm water runoff controls such as site grading and diversion ditches, and reclamation covers have been placed on inactive dump slopes and tops.

No seepage resulting from infiltration of rainfall through the waste dumps has been observed to date. The "seepage" referred to in the August 10, 1993, letter from the Water Quality Bureau (Exhibit K) refers to two preexisting springs, the Midas Spring on the east side and the Sunlight Spring on the west side, that were buried by the waste dumps. A response letter from GSM dated August 26, 1993, explains the situation in detail. Drains were constructed to route the springs out from under the dumps and to isolate this water from contacting the overlying waste rock.

16-14 The occurrence of infiltration into the tailing reclamation covers has been conservatively estimated and addressed in the long-term water management plan (Draft EIS Appendix A). An HDPE liner and compacted clay material underlie the entire area beneath the impoundment, main embankment and reclaim basins to prevent impacts to groundwater. Tailing water is draining from the impoundment, is collected on the underlying liner, and is conveyed by the drain system into the lined reclaim basins. The drain system and liner in impoundment No. 2 are functioning as designed. The collected tailing seepage is pumped from the reclaim basins back into the process circuit.

There is no reason to believe the drains will not continue to work as designed. However, in the event that the drains under the impoundment and dam ceased functioning over the long term, the impoundment is constructed and lined such that seepage would still migrate towards the embankment, seep through the sandy embankment materials, and would ultimately report to the reclaim basins.

16-15 The water management plan in Draft EIS Appendix A addresses all foreseeable sources of ARD-impacted discharge at GSM, including water pumped from the pit. The inflow estimates incorporate conservative inflow assumptions and contingencies to ensure water resources are protected. GSM's reclamation bond guarantees the water management controls will be implemented as necessary.

16-16 Backfilling the pit does not eliminate the formation of ARD and associated need for groundwater control. The hydrogeology of the pit area is such that regional groundwater will continue to flow through the pit area with or without backfill. The upgradient groundwater will come into contact with reactive material along the pit margins and will mobilize residual ARD products in the backfill material. These conditions necessitate long-term groundwater control and treatment for the pit area under any scenario.

Response to Letter 16

The recommendation to seperate the pyrite from the tailing stream has merit but is neither technically nor economically feasible for GSM. GSM had previously evaluated the use of flotation in conjunction with cyanidation to extract gold from the ore. This process could potentially be used to segregate pyrite from mill tailing. However, GSM's analysis concluded that addition of the flotation process, in its most competitive configuration, did not result in separation of mill tailing into two streams of high and low pyrite content. That is, the concentrate leach tailing had to be recombined with the flotation tailing to achieve partial cyanide destruction and flotation tailing leaching. Also, the flotation concentrate averaged 27 percent by weight of the ore feed and would still require a large tailing disposal area.

16-17 The use of cement to neutralize tailing was evaluated early in the EIS process but was eliminated from detailed analysis in the Draft EIS because this option does not eliminate the need for long-term water management and ARD treatment at GSM, it is cost prohibitive, and because long-term ARD from Impoundment No. 2 will be minimal relative to other sources. Also, it is questionable whether the application of cement paste beneath Impoundment No. 1, in the open pit, and for the waste rock areas would be technically feasible. Paste technology is normally implemented in the beginning of mine operations. GSM's facilities are already in place. Even if technically and economically feasible, there are no assurances this measure would eliminate, or even reduce, the need for long-term water management and treatment.

Letter 16 Continued

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16-17 regard (including redesign alternative to cover all tailings (TI1 & TI2) w/ cemented paste cap). Neutralizing grout beneath TP 1 in spring area of water contact to prevent infiltration from below. This is an example of why tailings ponds, leach pads, and waste dumps "by strict rule" should never be placed on "wet" areas. In the extreme, amended paste could be formed from the tailings and returned as backfill to the pit, or be used to highly effectively "cap" the waste dumps with a both neutralizing and nearly impermeable barrier.

16-18 The only means of eliminating, or most probably reducing ARD generated from the pit would be backfilling. A Cost/Benefit analysis should be performed for backfilling (partial or complete) to the extent necessary to eliminate treatment in perpetuity. The analysis performed on a detailed cash-flow basis using the best available most accurate site specific costs (those of the company) so it can be reasonably assessed in light of feasibility (technical and economic), long-term considerations and constitutional issues (including non-economic cost/benefits). A detailed study should be performed to determine the extent to which backfilling could eliminate the need for pumping and treatment in perpetuity. Other measures should be considered including grouting of pit walls in any new areas to neutralize ARD and prevent infiltration of oxygen and/or surface grouting pit walls with cemented tailings paste. The analyses performed by the agencies in the DEIS is essentially meaningless, as no details of the basis for costs is provided, and "industry averaged" costs, irrelevant to the particular situation at GSM, are used.

ARD Reclamation Criteria

According to Section I.B.3.b, Reclamation of "Objectionable Effluent", under the MMRA ". . . . the reclamation plan must include provisions which provide for:

a) Insulation of all faces from moisture or water contact by covering to a depth of 2 feet or more with material or fill not susceptible itself to generation (emph. added) of objectionable effluents; (or)

b) Processing of any objectionable effluents in the pit before (emph. added) they are allowed to flow or be pumped out of the pit to reduce toxic or other objectionable ratios to a level considered safe to humans and the environment; (or)

c) Drainage of any objectionable effluents to settling or treatment basins when the objectionable effluents must be reduced to levels considered safe by the departments before release from the settling basin; or

d) Absorption or evaporation of objectionable effluents in the open pit itself."

"The impact evaluation in Chapter IV suggests that regardless of whether mining ceases or continues at the mine site, there is potential for groundwater contamination over time from effluents generated by past mining activities."[10]

Questions/Comments

16-19 1. The geochemical characterization being performed is inadequate to prove suitability of the waste rock as material "not susceptible itself to generation of objectionable effluents."

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[10] Ibid., p. 19

Response to Letter 16

16-18 Partial backfill of the pit to eliminate the development of the pit lake was evaluated as an alternative in the Draft EIS (See Section II.B.7, Partial Backfill Alternative). However, as stated in Section II.B.7, a groundwater pumping and water treatment system would still be needed to maintain the pit area as a hydraulic sink to prohibit potential groundwater degradation downgradient from the pit. Thus, perpetual water treatment would not be eliminated.

The comment letter recommends that the economic feasibility of backfilling should be assessed. This assessment has been performed by the MDEQ and was reviewed by an independent CPA firm to verify that backfilling is not economically feasible. The economic assessment is discussed in the Summary section of the Draft EIS. The need for perpetual treatment with or without pit backfilling is discussed throughout the Draft EIS and specifically in Draft EIS Appendix A. Further evaluation of backfilling to reduce or eliminate the need for pumping and treatment is not necessary.

With respect to evaluating grouting the pit walls, to our knowledge, pit wall grouting is not a proven technology that has been applied to control ARD in pit lakes. In addition, it does not appear that this alternative or mitigation measure was previously mentioned for evaluation during the EIS scoping process. Although, this measure has not been evaluated, it seems very unlikely that this would be a cost-effective long-term solution for mitigation of ARD. A grout type application in this setting would likely require long-term maintenance and potential success of this measure to permanently prohibit ARD development in the pit is questionable.

16-19 Geochemical characterization of the oxide waste rock has been specifically designed to ensure there is little likelihood the cap rock will produce ARD, which might then impact the reclamation cover. Characterization strategy is based on a combination of visual, static, and kinetic tests to ensure unsuitable materials are not used as capping material. GSM relies on the NAG, or "Net Acid Generation", test for much of the oxide characterization work. This test uses hydrogen peroxide to rapidly oxidize samples and has been cross referenced with both kinetic and static tests. Material is tested as it is mined for salvaging as oxide and then analyzed again after being placed for reclamation. The research conducted at GSM showed that materials with a NAG pH of 4.0 or greater will remain neutral without the need for lime amendment.

Letter 16 Continued

Comments on Golden Sunlight Mine DEIS - Page 13

16-20 2. Objectional effluent being treated after being pumped from pit rather than "before."

16-21 3. Treatment basins are not being used, instead objectional effluent is being allowed to flow to groundwater and then "capture/pumpback" systems. This might imply the requirement for a liner under drainage source directing to treatment basin (or effluent holding pond).

16-22 4. Since they aren't doing a, b or c, are they doing d? Absorption or evaporation of objectionable effluents in the open pit itself would essentially require a "dry" pit. The provisions, at least in the case of the GSM, would appear to allow for only a "dry" pit, indicating that mining below the water table should not have been allowed by the agencies.

16-23 5. The pit walls themselves act as "in situ" waste dumps. Therefore, the part of provision that they require cover would support the requirement for backfilling.

Oxidized Rock Cap

According to Section II.B.1.a. Current Mining Operations, Oxidized Rock Salvage, "Oxidized waste rock has a reduced [illegible], added potential to generate ARD. Oxidized waste rock is salvaged from the pit to provide nearly neutral [illegible], added material for reclamation capping." "All oxidized rock planned for removal is sampled according to compositional variability and tested for its potential to generate ARD. Combined field observations and acidity testing determine whether or not the material is suitable for salvage and subsequent use as reclamation capping." "Field Criteria . . . . include:

- The rock must have an oxidized color on the surface, and when broken must retain the oxidized color; and
- With the aid of a hand lens, no pyrite should be observed on any broken surface.

If 90 percent of the rock observed within a unit meets these criteria, the material is saved for use as oxidized rock capping. If these criteria are not met, the material is either tested to determine the degree of ARD potential, or alternatively, discarded in a waste rock dump. Based on kinetic testing and test plot data, all oxidized rock to be salvaged for reclamation capping material must have a net acid generating (NAG) final pH of 4.0 or greater (corresponding to a neutral rock unit) if it is to be used for reclamation without liming. Oxidized rock between 3.2 and 4.0 would be limed to neutrality before it could be used for reclamation. Oxidized rock with a NAG pH of less than 3.2 will not be used as a reclamation capping material."[10]

In the same section of the DEIS under Waste Rock Dump Reclamation - Oxidized Waste Rock Dump Cap it says, ". . . . . the new waste dump is tested for potential acid generation by analyzing composite samples taken from a survey controlled 100 ft x 100 ft grid . . . . . The number of samples tested for acidity is determined by the compositional variability observed in the dump material. Samples are submitted for either the modified Sobek method of acid-base accounting, or an on-site hydrogen peroxide based NAG pH test." "If samples have an acid-base accounting value using the modified Sobek method of greater than -20 (requiring amendment with 20 tons of lime or less per 1,000 tons of waste rock) and/or a NAG pH of greater than 3.2, then the dump surface will be treated as an oxidized cap and limed to neutrality . . . . . If samples have an acid-base accounting value of less than -20 (requiring amendment with greater than 20 tons of lime per 1,000 tons of waste rock) and/or a NAG pH of less than 3.2, then the upper 6 inches of the dump will be limed to neutrality before a 24 inch thick minimum cap of suitable or limed oxidized waste rock or borrow

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[10] Ibid, p. [illegible]

Response to Letter 16

16-20 Section II.B.3.b of the EIS summarizes the provisions of Section 82-4-336(5), MCA. That statute lists four methods for preventing water pollution from pits that exceed 2 acres in size. A permittee may use any of those methods. GSM proposes to use the third method, which requires draining the water into settling or treatment basins. GSM would pump the water to a treatment plant, which is the equivalent of a treatment basin. Water in the pit would not infiltrate to groundwater.

16-21 Please see the Response to Comment 16-20.

16-22 Please see the Response to Comment 16-20.

16-23 Please see the Response to Comment 16-20.

Letter 16 Continued

Comments on Golden Sunlight Mine DEIS - Page 14

material is placed on the dump."[16] Alternatively a 20 inch thick cap is allowed.

Section II.A.1. Hard Rock Geology and Mineral Resources describes the ARD generating mineralization particular to GSM, which says:

> "Pyrite is by far the most abundant metallic mineral. The average range of pyrite in GSM ore is between 3 percent and 5 percent. Concentrations of up to 20 percent can occur, but are not typical. The relatively fine texture (should say particle size) of the pyrite enhances the surface area available for ARD generation. Other metallic minerals occur in minor amounts within waste rock and vary in accordance to position in the ore body. Metals of potential concern for water treatment of effluent include aluminum, cadmium, copper, zinc and arsenic."[17]

Questions/Comments

16-24 1. The descriptions of "reduced" and "nearly neutral" and " " do not meet criteria under the MMRA. Further analyses of geochemical ARD characterization is needed of "oxide" capping rock. Given characterization of "oxides" vs. "neutral material" does not follow the recognized standards contained in the British Columbia Draft Acid Rock Drainage Technical Guide, which is generally recognized as Best Management Practices criteria for evaluating ARD. Characterization apparently relies only on "static" tests, which indicate only net neutralization. Kinetic leaching techniques should be used to simulate acid generation, as they indicate the difference in sulfide oxidation and carbonate dissolution rates. Studies have shown that there is generally little predictivity unless there is a substantial "excess" of alkalinity, not "reduced" or "near neutral" acidity.

16-25 2. An additional problem, shared by both static and kinetic testing methods, is their relevance is limited by the degree to which the samples are truly representative of the waste dump (and pit wall, or tailings) material's compositions. In order to reliably use either technique there must be little variation in rock characteristics in the waste dumps, or there must be clear domination by alkaline-producing material. Samples collected at grid intersections don't show compositional variability. Sampling method could easily result in both inadvertent and purposeful bias by persons taking samples.

16-26 3. A compositional variability study is needed to assess the heterogeneity of the waste rock to determine whether samples are truly representative of the waste materials. If the variability shows an unacceptable (low) level of confidence, additional measures should be taken to decrease the likelihood of acid generation. This may be accomplished by selective handling and treatment of the pyritic material, such as inundation or isolation, or by the addition of alkalinity. The objective should clearly be the minimization of the likelihood of long-term water treatment. In deference, the DEIS offers primarily mitigation of what is assumed to be a foregone conclusion of water treatment in perpetuity.

Water Quality

Section II.B.1.a. Surface Water Quality contains the information that:

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[16] Ibid. p. 4-51.

[17] Ibid. p. 121.

Response to Letter 16

16-24 Please see the Response to Comment 16-19.

16-25 GSM has an extensive database of testing results for oxide materials that amply demonstrates the material's homogeneity. Comparatively less work is done on the waste rock itself, as there is no question the vast majority of the waste rock is highly acidic and capable of generating ARD. This material is handled accordingly to avoid any possibility of intermixing with oxide material.

16-26 Please see the Response to Comment 16-25. Inundation or addition of alkalinity are not feasible for the waste rock dumps and would not necessarily preclude long-term water treatment. The reclamation strategy seeks to isolate the waste rock through the use of a cover system including 24 inches of oxide material and 18 to 24 inches of cover soil. This cover system supports a vegetative cover that minimizes infiltration of incident precipitation.

Letter 16 Continued

Comments on Golden Sunlight Mine DEIS - Page 15

> "No ARD is currently discharging from the waste rock dumps. However, monitoring of conditions in reclaimed dumps shows that the waste rock has the geochemical potential to generate ARD and that oxidation of sulfide minerals is presently occurring due to infiltration of moisture. At present these processes appear to be effectively limiting the production of ARD at dump toes and, thereby, its potential migration and impact on the local environment."

According to Section IV.B.1.a. Waste Rock Dumps, Waste Rock Impacts to Water Quality During Mining Operations:

> "Geochemical testing data for the waste rock generated at Golden Sunlight Mine indicate that the majority of waste rock materials are potentially acid generating" ". . . . long-term impacts to groundwater quality in the vicinity of the waste rock dumps would likely occur because of gradual ARD from the waste rock dumps. . . . To address potential impacts downgradient from the waste rock dumps, GSM has applied to the state of Montana for a "mixing zone" that would allow some degradation of water quality within its proposed boundaries." "The analyses provided in Appendix B indicate that with an efficient West Waste Rock Dump groundwater capture system, which is part of GSM's Water Management Plan, ARD impacts can be contained within the mixing zone limits. . . . It is technically feasible to install an efficient groundwater capture system for the West Waste Rock Dump, provided adequate site characterization is done to identify preferential flow paths in bedrock fracture zones, and/or conservative capture well spacings are used to ensure that all major fracture zones are intersected by at least one well."

In the same section under Estimation of Long-Term ARD Production by Waste Rock Dumps:

> "Research at other sites indicates waste rock dump capping greatly reduces infiltration and reduces the potential for experiencing an initial, very concentrated spike or peak of ARD discharge that is substantially more concentrated than the long-term average. . . . However, based on the results from long-term ARD studies conducted at other sites, ARD load could return to a value dictated by the overall oxidation rate in the long-term . . . . for a range of infiltration rates the long-term ARD load would be expected to be similar." "Seepage from waste rock dumps for the 0.25 inch infiltration is estimated to ultimately be about 10 gpm, or 2.2 million gallons per year as the total contribution from all waste rock areas."

And under Estimation of Long-Term Fate and Transport of Waste Rock ARD:

> "A numerical simulation was performed by the EIS review team to assess the ultimate extent and timing of ARD impacts. . . . The model simplifies very complex hydrogeological and geochemical processes. . . . The model was intended to characterize the types of possible impacts, not to accurately quantify those impacts." "The results of the model indicate that potential impacts to groundwater range from being negligible on the east side of the Bull Mountain, to experiencing elevated levels of sulfate and trace metals on the west side of Bull Mountain."
>
> "Uncertainties regarding the model inputs and the simulation itself allow for only a low to

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Ibid. p. 141.

Ibid. p. 248-255.

Response to Letter 16

Letter 16 Continued

Comments on Golden Sunlight Mine DEIS - Page 15

> moderate level of confidence in the model predictions of specific ARD concentrations and travel times to various locations downgradient of the waste rock dumps." ". . . . background concentrations of dissolved trace metals in the groundwater at the mine site are provided in a database maintained by mine staff . . . ." "Considering the variability in dump dimensions and textural characteristics, and the likelihood that preferential flow paths may be present, the time frame before any significant waste rock ARD seepage begins to occur from the base of the dumps ranges from tens to hundreds of years."
>
> "A low to moderate level of confidence should be applied to these quantitative estimates of ARD concentrations and time frames. However, the results of the mixing cell model do allow the following general, qualitative conclusions to be made with a reasonable level of confidence"

under Long-Term Monitoring and Mitigation for Unanticipated Waste Rock ARD, the DEIS says,

> "In addition, the water infiltration rate through the waste rock dumps could be higher than estimated, resulting in a greater flow of ARD than anticipated."

and under Waste Rock Impacts to Water Quality:

> "It is possible to estimate the rate at which pyrite and other sulfide minerals are oxidizing by monitoring the internal temperature of the dump. The unreclaimed waste rock dump monitored by GSM appear to have a somewhat higher average temperature than reclaimed sites. However, the available data indicate that the cover provides no definitive control on oxidation rates." "If the ARD generated by the West Waste Rock Dump is greater than estimated, or if ARD is released from the dump sooner than anticipated along preferential, discrete flow paths, additional measures will be required to prevent ARD impacts to surface water and groundwater quality outside of the GSM-proposed mixing zone boundary (see Section IV.P, Potential Mitigation and Monitoring, Measure W-4)."

According to Section IV.B.2., Proposed Action Alternative, Waste Rock Dumps "Increased ARD production over the No Action Alternative is expected." The proposed mitigations are addressed in Long-Term Monitoring and Treatment for Waste Rock ARD which says,

> "GSM proposes a monitoring program where monitoring wells downgradient of the Waste Rock areas have a spacing of 1,000 to 2,000 feet. . . . However, a detailed exploration program is needed to determine the location and orientation of significant fracture zones in the West Waste Rock Dump area. . . . Each fracture zone should have a monitoring well penetrating its saturated portion. . . . suggests that some fracture zones were probably missed and a reassessment may be needed. The data analysis format appear to be inadequate." and further on "The modeling exercise showed that capture efficiency is reduced to 80 percent if a single fracture zone is missed."
>
> "Pump and treat technology is know to be effective for control or containment of groundwater, but is generally considered ineffective for aquifer restoration because of the excessively long time periods required to reduce concentrations to health-risk based levels. . . . But when and if the ARD impact is realized in the groundwater aquifers, and a capture/treatment system has been installed, it may be reasonable to seek other possible mitigation measures."[10]

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[10] Text, p. 272-274.

Response to Letter 16

Letter 16 Continued

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Comments/Questions

16-27 1. ARD generating potential should have been identified by characterization during permitting process, and as mine wastes were tested/placed during past operations, not by monitoring after the fact. Why hasn't a more complete characterization program been required of GSM? Predictive and representative characterization of the proposed material to be mined should be required and included in the DEIS. Need to do characterization and then evaluate technical and economic feasibility in order to assess impacts & mitigations. This is an example of "Permit now and ask questions later." The mitigation will work "provided" [illegible] characterization so indicates - if it doesn't mitigation won't be effective and no feasible "backup" has been identified.

16-28 2. The DEIS confirms that eventually ARD will be generated from the GSM waste dumps, and the reclamation cap will only slow the ARD generation, not entirely prevent it. The models used to estimate infiltration assume consistent "cap/cover" conditions, and models are highly subject to assumptions used. The model does not take into account numerous local deviance from consistent conditions which might occur such as cracks, inconsistent soil depths, slumps, protrusions, loss of soil through cover voids, and most certainly not major slope failures.

16-29 3. Making qualitative conclusions and then calling them of "reasonable level of confidence" based on low to moderate level of confidence quantitative data is poor fundamental engineering/scientific practice.

16-30 4. Under expected infiltration rates of approximately 0.5 inch per year, high capture efficiency (up to 93 percent) will be needed to bring ARD concentrations low enough to meet Montana water quality standards at GSM's mixing zone boundary. What kind of capture efficiency would be needed in the event of even higher flow (assumably capture efficiency >95%)? Is the efficiency technically achievable? Measure W-4 does not address mitigation for the possibility of greater ARD production in terms of volume or concentrations as a result of uncontrollable oxidation rates.

3.0 Impacts Associated with Perpetual Waste Water Treatment

DEIS

Bonding

According to Section [illegible] Current Mining Operations, Permanent Post-Mine Water Treatment Plant:

> "GSM has submitted a total of $5,304,702 to MDEQ as part of the surety bond for this facility to be constructed and operate as long as necessary to ensure that discharge from the mine site meets Montana water quality standards. The amount of the bond was calculated using worst-case hydrologic and economic assumptions. Given a conservatively estimated rate of return, interest on the principal should be sufficient to pay for all maintenance, operations, and periodic replacement of the facility every 20 years." "In June 1996, ... GSM submitted another bond increment of $945,702, to keep the water treatment bond adequate for treating 300 gpm of inflow. At the end of mine life, the surety bond portion for the permanent water treatment facility will be converted to a permanent trust fund and assigned to the state of Montana. The state of Montana will

Response to Letter 16

16-27 ARD-generating potential of mine wastes at GSM was identified during previous permitting. Geochemical testing of the waste rock generated at GSM indicates that the majority of these materials are potentially acid-producing, as discussed in Draft EIS Appendix I. GSM considers all non-oxide waste rock as potentially acid-producing, and handles this material according to established reclamation protocols.

16-28 There are uncertainties in the model used to estimate infiltration. Some of the uncertainties relate directly back to interpretation of the data collected on the waste dumps. The work group that modeled the infiltration evaluated a range of infiltration values specifically because of these uncertainties. The models do assume consistent cap/cover conditions based on requirements that the cap/cover system meet specific requirements for consistent placement. Any larger scale variations, either through the development of cracks, slumps, or larger scale mass wasting features, will require that GSM repair the slope in order to ensure the required level of consistency on which the model is based.

16-29 The primary purpose of the hydrogeochemical model presented in the Draft EIS Appendix J was to evaluate whether waste rock areas could impact water resources. Based on the level of analysis performed, it is entirely appropriate to place a reasonable level of confidence to the qualitative conclusions.

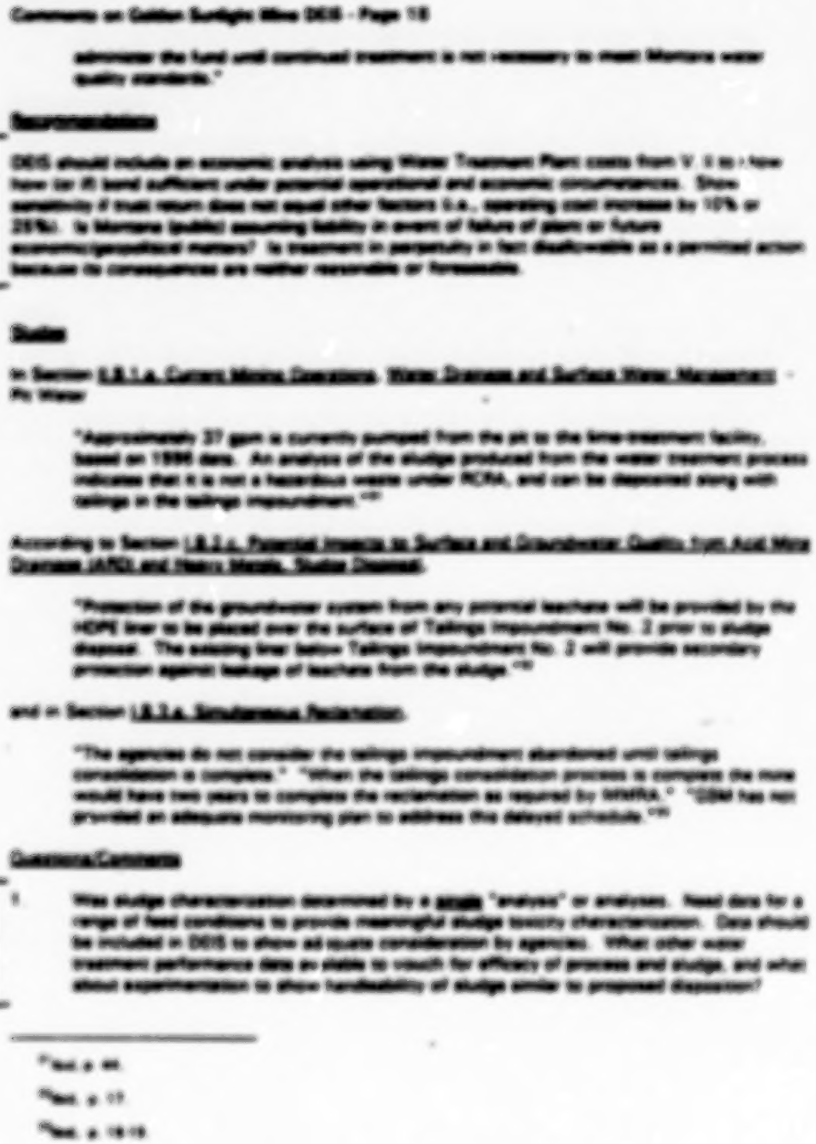
The quantitative uncertainties of the modeling process may reduce the level of confidence in specific ARD concentrations and seepage time of travel derived from the model. However, these uncertainties do not affect the determination of potential impacts and the need for water management plans to address potential impacts. More importantly, the quantitative uncertainties of the model do not affect the types of controls and contingencies that were selected for water management described in Appendix A.

Response to Letter 16

16-30 In theory (as presented in Draft EIS Appendix L) high capture efficiency is technically achievable in the fractured bedrock aquifer when all major fracture zones are intercepted by at least one well. The Draft EIS Water Management Plan (Appendix A) includes additional hydrogeologic studies by GSM to better characterize the bedrock aquifer, and to optimize placement of monitoring and capture wells. The groundwater controls in Appendix A provide contingencies for higher than expected inflow from various sources to accommodate higher capture efficiency, and to ensure the level of treatment is achieved that protects downgradient water quality. These contingencies could include decreasing the spacing of capture wells to improve capture efficiency if needed.

Impacts from higher than expected infiltration into the dump surface are evaluated in Appendix J. Infiltration of ARD into groundwater from the base of the West Waste Rock Dump was limited to 0.8 inch/year under the worst-case (unreclaimed) dump surface infiltration rate of 2 inches/year because of the shallow bedrock condition. It was assumed that under higher than expected infiltration rates, seepage would run off the bedrock surface, emerging as springs and seeps, and would not contribute to groundwater recharge. Mitigation Measure W-4 (b), as modified (see Response to Comment 2-5), describes toe drains and shallow capture wells that would be installed to intercept shallow ARD-impacted groundwater flows that are not captured by the primary deep capture well system.

Letter 16 Continued



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> administer the fund until continued treatment is not necessary to meet Montana water quality standards."

Recommendations

16-31 DEIS should include an economic analysis using Water Treatment Plant costs from V. II to show how far IR bond sufficient under potential operational and economic circumstances. Show sensitivity if trust return does not equal other factors (i.e., operating cost increase by 10% or 25%). Is Montana (public) assuming liability in event of failure of plant or future economic/geopolitical matters? Is treatment in perpetuity in fact disallowable as a permitted action because its consequences are neither reasonable or foreseeable.

Studies

In Section II.B.1.a, Current Mining Operations, Water Drainage and Surface Water Management - Pit Water

> "Approximately 37 gpm is currently pumped from the pit to the lime-treatment facility, based on 1996 data. An analysis of the sludge produced from the water treatment process indicates that it is not a hazardous waste under RCRA, and can be deposited along with tailings in the tailings impoundment."[27]

According to Section IV.B.2.c, Potential Impacts to Surface and Groundwater Quality from Acid Mine Drainage (ARD) and Heavy Metals, Sludge Disposal,

> "Protection of the groundwater system from any potential leachate will be provided by the HDPE liner to be placed over the surface of Tailings Impoundment No. 2 prior to sludge disposal. The existing liner below Tailings Impoundment No. 2 will provide secondary protection against leakage of leachate from the sludge."[28]

and in Section II.B.3.a, Simultaneous Reclamation,

> "The agencies do not consider the tailings impoundment abandoned until tailings consolidation is complete." "When the tailings consolidation process is complete the mine would have two years to complete the reclamation as required by MMRA." "GSM has not provided an adequate monitoring plan to address this delayed schedule."[29]

Questions/Comments

16-32 1. Was sludge characterization determined by a single "analysis" or analyses. Need data for a range of feed conditions to provide meaningful sludge toxicity characterization. Data should be included in DEIS to show adequate consideration by agencies. What other water treatment performance data available to vouch for efficacy of process and sludge, and what about experimentation to show handleability of sludge similar to proposed disposition?

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[27] Ibid., p. 44.

[28] Ibid., p. 17.

[29] Ibid., p. 18-19.

Response to Letter 16

16-31 In estimating the costs associated with water treatment, the agencies try to anticipate all reasonable circumstances under which the treatment plant may operate. Uncertainties regarding quantity and quality of the influent, potential cost escalations, new water sources, plant operations, etc., are accounted for through contingency costs assigned to each of the identified parameters. Estimating for treatment in perpetuity is addressed in a similar manner by making reasonable assumptions about the operation and potential cost changes over time. MDEQ is required to review the bond every 5 years, and more frequently if there are extraordinary changes in the operation, which would affect the estimate or any underlying assumptions. While making estimates about costs and cost trends far into the future contains risk in itself, the agencies try to make accurate estimates based on currently available information. The agencies believe the estimates reflect prevailing and anticipated costs.

16-32 Two sludge samples were analyzed using TCLP and the results are presented in Draft EIS Appendix O. The feed water chemistry for the sludge samples is characterized by the pit water in Table 2-1 of Draft EIS Appendix A. The feed water for long-term treatment of all potential sources at GSM also is characterized in Table 2-1 of Appendix A. This table shows that the combined inflow to the treatment plant will be of better quality than the pit water used for the TCLP test. This means that the sludge from long-term treatment is likely to be of better quality than shown in the risk analysis presented in Appendix O. GSM is conducting further evaluation of water treatment using the existing water treatment plant on site. All information collected to date indicates that the proposed long-term water treatment process will meet performance criteria described in Appendix A.

Letter 16 Continued

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16-33 2. Sludge will be voluminous and difficult to handle, with potential for difficulties in compaction and dusting. TCLP test data used to characterize sludge toxicity not given, and should be reviewed. Is sludge innocuous, or is the liner system being relied upon prevent infiltration and seepage? The liner system is not designed to last 1000 years, or into perpetuity. And the liner system leaks (they all do), and seepage could conservatively be as much as an order of magnitude or greater than estimated in DEIS.

16-34 3. Agencies propose after one year of no evidence of further consolidation reclamation be commenced. However, some tailings surfaces are to be used to store sludge. Does this mean reclamation will not take place until sludge deposited (on top of consolidated tails)? This may be technically infeasible, and impacts have not been assessed. Another example of "Permit now and mitigate later?"

Treatment Process

According to Section II.B.1.a. Permanent Water Treatment Plant, Treatment Plant Reliability:

> "No studies have been identified that address the performance reliability of water treatment plants of the type proposed for this project." "In summary, a high degree of overall performance reliability can be expected if the treatment plant is correctly designed, staffed and operated in accordance with a properly prepared operations manual, maintained in accordance with the equipment manufacturers recommendations, and equipment is replaced at appropriate intervals."[illegible]

Comment/Question

16-35 There are existing water treatment plants of the type proposed for this project. A study should be conducted prior to the DEIS that addresses the performance reliability of such plants. The correct design of the water treatment plant is critical, and more detailed research, design and engineering to demonstrate its efficacy and costs should be conducted prior to its consideration in the DEIS.

4.0 Pit Backfilling Feasibility

Memorandum and Order

The Court determined that under the MMRA "Because subsection (7) (of Section 82-4-336 (9) MCA) exempts only those open pits and rock faces which may not be feasible to reclaim, DSL should have at least considered the possibility of reclaiming the pit before concluding that the measures set out in subsection (5) are sufficient. Furthermore, Article IX, Section 2 of the Montana Constitution, provides that "all lands disturbed by the taking of natural resources shall be reclaimed." "That language does not exempt open pit mines from reclamation. As discussed below, because subsection (7) does not require reclamation of open pit mines which may not be feasible to reclaim, it is also in conflict with Article IX, Section 2 of the constitution."[illegible]

[illegible] Ibid., p. 274

[illegible] Montana First Judicial Court, MWP et al vs MDSL/GSM, Cause No. CDV-92-486 Memorandum and Order (1994), p [illegible]

Response to Letter 16

16-33 TCLP test data used to characterize sludge toxicity are provided in Draft EIS Appendix O. The operational considerations and potential environmental risks associated with water treatment and sludge disposal have been evaluated and are discussed in Draft EIS Appendices C, K, and O. Dust formation will be controlled with a minimum 20 percent moisture content of sludge. In addition, GSM will apply a chemical soil-binding agent to the surface of any areas that become dry enough to form dust. Text has been added to Draft EIS Appendix C.

The sludge from GSM's proposed treatment plant will be dewatered before it is placed in disposal cells. Additional dewatering through evaporation and draining will occur after the material is placed. Sludge disposal cells will be underlain by an HDPE liner to collect any residual seepage from the sludge material, and cells will be placed on the surface of decommissioned Impoundment No. 2, which also is underlain by an HDPE liner and compacted clay-rich material. The potential for liner tears during sludge placement would be minimized through the use of appropriate placement techniques. (Sludge will be hauled by truck or placed with a high-solids slurry pump, an alternative placement method described in EIS Appendix A. GSM will conduct feasibility testing of each disposal option before it is implemented.)

The life expectancy of the HDPE liners will depend on physical conditions of the site. The sludge disposal cells will be constructed over portions of the dewatered and consolidated tailing where there is minimal potential for settlement that could cause liner failure. The potential for seepage is further minimized by the underlying compacted clay-rich material, which acts as a secondary, low permeability liner. Dewatering of the sludge will ensure that any liner leak would not contribute appreciable seepage beyond that which might infiltrate from normal precipitation. Infiltration will be minimized by a runon diversion system and capping and revegetating of the tailing/cell surface. The conservative estimate of potential long-term outflow from Impoundment No. 2 (less than 10 gpm) due to infiltration into the reclamation cap provides suitable contingency to account for any leakage from a sludge disposal cell. As an additional contingency measure, GSM has constructed groundwater recovery wells downgradient of the impoundment area, as described in the water management plan in EIS Appendix A.

See also the Response to Comment 16-39.

16-34 Tailing impoundment reclamation is discussed in Sections II.B.1.b and II.B.2.b. After the tailings have consolidated, the surface will be capped with 24 inches of local borrow material and 24 inches of soil and then revegetated. Since not all of the surface of Tailing Impoundment No. 2 will be needed for sludge disposal immediately, this reclamation plan will be implemented. As stated in Appendix C, Revised Sludge Disposal Plan, when a new sludge disposal cell becomes needed, a portion of the reclaimed impoundment surface will be stripped to accommodate the new cell. The stripped capping material will be salvaged and stockpiled for future use in covering and revegetating the cell when it is filled up.

Response to Letter 16

16-20 The issue of treatment plant reliability has two aspects: 1) reliability of the mechanical systems in the plant, and 2) performance reliability of the treatment process with regard to meeting the water quality goals. Appendix K in the Draft EIS addresses the systems reliability using a Failure Modes and Effects Analysis (FMEA). This FMEA evaluates each of the primary components of GSM's proposed treatment plant in consideration of the potential environmental consequences resulting from failure of that component.

The applicability of this type of treatment to the water quality conditions at GSM is demonstrated in Draft EIS Appendix A. Appendix A presents a preliminary design of the treatment plant to allow an evaluation of the effectiveness and potential impacts associated with the proposed treatment methodology for the Draft EIS. This evaluation has determined that the plant can be constructed and operated with a high degree of performance reliability.

Also, a pilot scale plant has been constructed and is presently in operation at GSM. The results obtained from this existing treatment plant are being evaluated and will provide for a good foundation with which to finalize the design of the long-term treatment system.

As stated on page 274 of the Draft EIS under the heading of "Treatment Plant Reliability," no prior studies have been identified that address the performance reliability of water treatment plants of the type proposed for this project. Further, since most water treatment plants and treatment requirements are unique, predicting reliability using historical performance of similar plants is generally not possible. The pilot scale plant provides a much more reliable means to assess the reliability of the proposed treatment processes than any literature review could.

Letter 16 Continued

Comments on Golden Sunlight Mine DEIS - Page 23

DEIS

Pit Level and Water Production Information

16-36 Existing Conditions

The existing conditions, described in Section I.A.5. Operations Under Existing Mine Permits[36] identifies a current pit elevation of 5,225 feet with a total disturbance area of 2,336 acres. However, in Section IV.A.1.a. Geologic Impacts Associated with Discontinued Mining, "The elevation of the pit lake will be between 5,075 and 5,100 feet under the No Action Alternative."[37]

According to Section IV.B.1.a. Open Pit, Open Pit Impacts to Long-Term Water Quality, "Under the existing reclamation plan, a small (1- to 4-acre) lake will be allowed to form in the bottom of the pit, with water levels controlled between 5,075 and 5,100 feet elevation by pumping an estimated 48 to 54 gpm of water to a permanent water treatment plant for treatment and release."[38]

Proposed Action

According to Section IV.A.2.a. Geologic Impacts Associated with Continued Mining, "The elevation of the pit lake is estimated to be 5,050 feet under the Proposed Action. The pit bottom would be deepened to approximately elevation 4,700 feet, such that the pit lake would be about 350 feet deep. The deeper pit, with higher pit walls, will be less stable than the No Action Alternative during operation."[39]

No Pit Pond Alternative

The DEIS in Sections II.B.6.b. Reclamation Under the No Pit Pond Alternative, says ". . . . the pit would be partially backfilled with waste rock to the 4,800 foot elevation (approximately 100 feet. There would be 712,750 tons of backfill." "Dewatering to the 4,800-foot level would require perpetual removal of approximately 102 gpm."[40]

Partial Backfill Alternative

According to Section II.B.7.b. Reclamation Under the Partial Backfill Alternative, "Conceptually, backfilling the pit to a daylight level and reclaiming the upper pit slopes would consist of two activities: 1) hauling approximately 52 to 55 million tons of waste material from the East Waste Rock Dump to the pit and beginning to cap the highwall at a 2:1 slope, and 2) hauling approximately 30.8 to 33 million tons of waste material from the West Waste Rock Dump to complete capping of the highwall."

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[36] United States Department of Interior and State of Montana, Volume I, Draft Environmental Impact Statement, Golden Sunlight Mine, (1997), p. 8.

[37] Ibid., p. 230-236.

[38] Ibid., p. 290-296.

[39] Ibid., p. 237-242.

[40] Ibid., p. 95.

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Response to Letter 16

16-36 The pit elevation of 5,225 feet identified in Section I.A.5 refers to the elevation at the time of writing. This statement has been deleted and replaced with a more accurate statement: "The elevation of the pit bottom at the end of the *Interim Dump Plan* will be approximately 5,075 feet." The statement in Section IV.A.1.a. is correct.

Letter 16 Continued

Response to Letter 16

Comments on Golden Sunlight Mine DEIS - Page 21

Under Pit Dewatering and Water Treatment, "The Partial Backfill Alternative is expected to reduce the amount of surface water recharge that potentially has to be treated (by up to approximately 52 gpm) because storm water could be routed directly off of the reclaimed slopes out of the pit area. It would therefore reduce the amount of dewatering required to maintain the pit as a hydrologic sink. However, a pit dewatering and water treatment system would still be needed under the Partial Backfill Alternative to prevent groundwater from flowing from the rock beneath the reclaimed pit area. . . . GSM projects that dewatering to an elevation of approximately 5,050 feet (the point of contact with the colluvium) would be required in the partially backfilled pit to maintain the area as a sink."[illegible]

In Section II.A.7. Partial Backfill Alternative, "The costs of backfilling the pit and capping with suitable rock and topsoil are estimated at $32,500,000."[illegible]

Complete Backfill

According to Section II.C.4. Complete Backfill Alternative, "The estimated cost to GSM of completely backfilling the pit is $81,376.00. This alternative was eliminated because costs to GSM would be prohibitive. In addition, pit water treatment would continue to be necessary. . . ."[illegible]

Pit Wall Stability

According to Section IV.A.1.a. Geologic Impacts Associated with Discontinued Mining, Potential Pit Wall Instability, "In particular, rock mass movements may be expected along the northwest area of the pit, where the unfavorable orientation of existing faults renders this area less stable." Under Environmental Consequences, "Potentially adverse environmental consequences are linked to ground movement potential. . . . The results of FMEA for the No Action Alternative indicate that most of the identified modes of failure have a low to very low probability of occurring. Moderately likely failure modes that have a significant probability of occurring are related to instability (ravelling) of the pit walls and consolidation settlements on the tailings impoundment covers. These potential ground movements are anticipated to have negligible environmental consequences. The failure modes that have the worst consequences (tailings dam failures) have very remote likelihoods of occurring"[illegible]

In Section IV.A.5.a. Geologic Impacts Associated with the No Pit Pond Alternative, the DEIS says, "Current pit high wall slopes average 61° between the benches. As the pit expands and deepens, the high wall slope may locally increase as deeper ore zones are pursued." "Pit wall slopes would continue to undergo alternating periods of rock sloughing and quiescence for year after mining has ceased. As the pit walls are acted on by gravity and the rock fracturing forces of freeze-thaw cycles, the near-vertical pit walls would ultimately shed material to for talus slopes at their base.

[illegible] Text, p. [illegible]

[illegible] Text, p. [illegible]

[illegible] Text, p. [illegible]

[illegible] Text, p. [illegible]

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PAGE

Letter 16 Continued

Comments on Golden Sunlight Mine DEIS - Page 22

trending to ever decreasing vertical walls at the higher elevations." This natural process would take longer to achieve a state of pit slope equilibrium (und. added) owing to the taller pit walls proposed under this alternative. Unless triggered by severe tectonic activity, the pit walls should achieve a post closure equilibrium (und. added) in 10 years or less, with further minor adjustments in excessively wet or high freeze-thaw event years and in years with earthquakes."[47]

According to Section IV.A.7.a. Geologic Impacts Associated with the Partial Backfill Alternative, "All acid producing rock within the pit would be capped." "Backfilling the pit and partially capping the pit walls under the alternative would aid in decreasing the amount of pit wall sloughing over time and facilitate pit wall equilibrium sooner than other would be realized under all but the No Action Alternative"[48]

Questions/Comments

16-37 The information contained in this section strongly supports the contention that the unreclaimed pit under the No Action or Proposed Action Alternatives would not meet the purposes of the MMRA as contained in ARM Section 82-4-302, specifically:

> "1(a) that the usefulness, productivity, and scenic values of all lands and surface waters involved in mining and mining exploration . . . . will receive the greatest reasonable degree of protection and reclamation to beneficial use;
>
> 1(c) for the recognition of the recreational and aesthetic values of land as a benefit to the state of Montana; and
>
> 1(d) priorities and values to the aesthetics of our landscape, waters, and ground cover
>
> (2) Although both the need for and practicability of reclamation will control the type and degree of reclamation in any specific instance, the basic objective will be to establish, on a continuing basis, the vegetative cover, soil stability, water condition, and safety condition appropriate to any proposed subsequent use of the area.

The DEIS in an almost blatant manner seems to disregard the purpose of MMRA with respect to pit backfilling, as well as numerous other matters. The MMRA would appear strongly support as a minimum standard the Partial Backfill Alternative, in terms of reasonable degree of protection, recognition of aesthetic values, vegetative cover, soil stability, water condition, and safety condition. Without this minimum degree of reclamation afforded by partial backfilling the usefulness and productivity of the open pit must be questioned. In addition, combined with Montana Constitutional prescriptions addressing the right to a safe and healthy environment, the MMRA lends itself to strong support of complete backfilling, and whatever means are practicable to further reduce the need for water treatment in perpetuity.

5.0 Other Issues

ARD Water Vapor Rise

DEIS Section I.B.2.b. Potential Impacts from Acid Water Vapor Rise in the Tailings Impoundment

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[47] Ibid. p. 246-247

[48] Ibid. p. 247

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Response to Letter 16

16-37 The portion of the MMRA quoted by the commentor indicates that the purpose of the MMRA is to provide that the usefulness, productivity, and scenic value of mined land receive "the greatest reasonable degree of protection and reclamation to beneficial use." It also recognizes that the degree of reclamation is controlled by its practicability.

The specific provision of the MMRA that deals with pit backfilling is 82-4-336(7):

"The reclamation plan must provide for the reclamation of all disturbed land. Proposed reclamation must provide for the reclamation of disturbed land to comparable utility and stability as that of adjacent areas, except for open pits and rock faces that may not be feasible to reclaim in the same fashion as other disturbed lands. In the case of open pits and rock faces, the reclamation plan must provide for reclamation to a condition:

> (a) of stability structurally competent to withstand geologic and climatic conditions without significant failure that would be a threat to public safety and the environment;
>
> (b) that affords utility to humans and the surrounding natural system to the extent feasible; and
>
> (c) that blends with the appearance of the surrounding area to the extent feasible."

This subsection was passed by the Montana Legislature in 1995 in Chapter 464, Laws of 1995. The Legislature provided the following statement of intent for this subsection:

> "In this bill, the legislature is implementing, with regard to open pits and rock faces that are the result of metal mining, the duty imposed upon it by Article IX, Section 2(1), of the Montana constitution, which provides that 'All lands disturbed by the taking of natural resources shall be reclaimed. The legislature shall provide effective requirements and standards for the reclamation of lands disturbed.'
>
> The drafters of this provision of the constitution expressly decided not to impose a constitutional requirement for a specified level of reclamation for all disturbed lands in all locations under all circumstances. Rather, they delegated to the legislature the duty to more specifically define reclamation in the public interest.
>
> The legislature expects, and this bill requires, that miners will prepare and submit to the state reclamation plans for open pits and rock faces. This bill requires that these plans must, at a minimum, provide for return of these lands to structural stability and that the plans must be protective of air and water quality as provided elsewhere in the metal mine reclamation laws. These requirements and standards will prevent risks to public health and safety and the environment and will thereby adequately protect the environmental life support system from degradation.
>
> In order to prevent unreasonable depletion and degradation of natural resources, the legislature finds that further reclamation of open pits and rock faces to provide functional uses and to blend with surrounding areas should be accomplished whenever feasible.

Response to Letter 16

> In determining feasibility of further reclamation, the legislature directs the Department of State Lands to consider and give effect to each of the following objectives:
>
> (1) to encourage mining as an activity beneficial to the economy of our state;
>
> (2) to encourage the production of minerals to meet the needs of society and the economic demands of the marketplace;
>
> (3) to encourage reclamation to a condition that is aesthetically unobtrusive;
>
> (4) to encourage reclamation to functional use;
>
> (5) to discourage requirements that may foreclose future access to mineral resources not fully developed by current mining operations;
>
> (6) to discourage requirements that will generate undesirable offsite environmental impacts.
>
> The legislature finds that functional post-reclamation uses include but are not limited to livestock grazing, agriculture, timber, recreation, wildlife habitat or other wildlife use, or other industrial use, including remining.
>
> The legislature finds that when reclamation has been accomplished in accordance with an approved reclamation plan, the economic and social benefits of mining outweigh the scenic and other impacts associated with open-pit mining."

Given the foregoing, the MMRA does not require the Department to require pit backfill in every instance.

The purpose of an EIS is to delineate reasonable alternatives to the Proposed Action and to analyze and describe the impacts of the Proposed Action and the alternatives. Because the total backfill alternative would render the project uneconomic under even the most optimistic gold price projection, it is not a reasonable alternative and was not analyzed. The partial pit backfill and other reasonable alternatives are analyzed.

Letter 16 Continued

and Waste Rock Dumps."[47] contains the agencies reasoning for not considering ARD water vapor rise as a significant issue.

Comments

16-38 The basis used for evaluating "vapor" addresses only the potential for "capillary rise". However, vapor rise can occur other than as capillary rise as demonstrated by "venting" observances which serves as evidence of other appreciable mechanisms that may contribute to either local or more widespread incidence of acid water vapor rise. Vapor rise may not be significant in the short term, however, in the long term it may render significant areas of the dump cover ineffective at propagating vegetation due to the incidence of acidification of soils. Neutralization of the waste materials with lime amendments (by mixing or layering throughout the ARD generating waste) would mitigate this potential occurrence.

Tailings Impoundment Leakage

Tailings Pond No. 1 Leakage

According to Section II.B.1.a. Current Mining Operations, Tailings Impoundments, "Tailings impoundment No. 1 is an unlined impoundment, and relies on a slurry cut-off wall and pumpback wells to control leakage."[48] and in Section IV.B.1.c. Tailings Impoundments, Tailings Impacts to Water Quality During Mining Operations, "Shallow groundwater below Tailings Impoundment No. 1 upwells into tailings material in the area of a historic spring and mobilizes tailings constituents."[49]

Tailings Pond No. 2 Leakage

According to Section III.B.2.f. Groundwater in the Tailings Impoundment Areas - Historic Seepage from Tailings Impoundment No. 2 East Reclaim Pond, "Tailings impoundment No. 2 has a synthetic liner to prevent seepage from the tailings into the underlying materials. The liner is a 60 mil, HDPE geomembrane that extends under the toe berm, the starter dam, and the impoundment. The foundation for the liner was prepared by excavating and recompacting the top 15 feet of soil material to form a less dense, less permeable base."

"A double-liner system comprising two, 60 mil HDPE geomembranes was originally built under the reclaim basins. This system was connected to the single liner underlying the tailings impoundment to for a continuous liner. The primary and secondary liners under the reclaim ponds are separated by an HDPE drainage net. The intent of this design is to allow detection of any leakage from the primary liner, and to convey the leaking fluids to leak detection sumps which are monitored"

"Since 1995, cyanide has been detected intermittently in groundwater in several T2PB monitoring wells downgradient of the Tailings Impoundment No. 2 reclaim ponds. . . . Cyanide was not detected in groundwater from the temporary wells, indicating that the impoundment was not the source. Inspection of the east basin liner indicated that the source of leakage was likely the east reclaim pond. . . . . Defects in the liner were detected and initial repairs were made . . . . by

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[47] Ibid. p. 15

[48] Ibid. p. 34

[49] Ibid. p. 266-271

Response to Letter 16

16-38 The agencies are aware of the potential importance of vapor transport, both as a mechanism for the removal of water, which has infiltrated into the waste material, and as a potential mechanism for contaminant transport. The potential for venting effects was addressed in Draft EIS Section IV.C, Soils and Reclamation (page 303) and Mitigation Measure S-1 (page 381). Several aspects of the monitoring plan for the mine would look specifically at this mechanism to ensure reclamation success is not compromised by vapor rise or "vent" development. The agencies continue to monitor vegetation near the vents to ensure reclamation success is not compromised. Neutralization of the waste rock is not feasible because of the tremendous volumes of lime that would be required. If necessary Mitigation Measure S-1 can be implemented to stabilize the vent areas.

Letter 16 Continued

Comments on Golden Sunlight Mine DEIS - Page 24

reconstructing the double-liner system . . . . A third liner was added to the sump area of the east basin. . . . An insufficient time has elapsed since the repairs were made to detect (based on monitoring well data) whether or not the repairs to the east reclaim pond liner have been effective in eliminating leakage."[illegible]

Neutralization of Tailings Acidity

Section II.C.3. Acid Neutralization Alternative describes the alternative saying, "This alternative would require that sufficient lime be added to the tailings slurry to prevent the formation of ARD. The most economical method would be to add 115 tons of kiln dust (110 percent $CaCO_3$ equivalent) per 1,000 tons to the tailings slurry. This would involve an initial capital cost of approximately $260,000 . . . . The operating cost is estimated at an additional $20,709,065 per year, or $144,963,455 through the life of the mine (to 2004)."

"This alternative was eliminated from detailed analysis primarily because there is no indication that ARD would be a problem at Impoundment No. 2. Once the impoundment was drained down, any infiltration of water through the reclamation cover would be collected in the lined seepage collection ponds." "GSM estimates this (infiltration) would be less than 10 gpm for the entire Tailings Impoundment No. 2 area." "If ARD is formed, it would be collected and treated."

"This alternative would result in the following disadvantages:

- Additional water consumption would occur as use of recycled water would be eliminated because of scaling problems;
- A long-term treatment system for ARD would still be required for the pit and possibly for long-term seepage from Tailings Pond No. 1; and
- Costs would be prohibitive to GSM. Annual operating costs include $20,652,065 for kiln dust ($12 per ton for kiln dust and $58 per ton for delivery). . . . It would not be economically feasible for GSM to implement this alternative and maintain a profitable operation."

Long-Term Tailings Seepage Water Quality

In Section IV.B.1.c. Tailings Impoundments, Tailings Impacts to Water Quality During Mining Operations, the DEIS says,

> "Therefore, in time, the tailings will acidify providing a potential for ARD. Potential impacts to water quality are dependent upon the amount of water infiltrating the reclaimed caps, which will be the source for ARD formation and groundwater loading." "The clay liner proposed as part of the tailings covers may be subject to cracking because of desiccation or freeze/thaw. Mitigation measure W-7 (See Section IV.P) addresses this issue."
>
> "Presently, groundwater beneath Tailings Impoundment No. 1 is mobilizing cyanide and TDS. In the future, this water could mobilize ARD constituents as the tailings become dewatered and exposed to oxygen." "Long-term ARD concentrations from the tailings seepage are assumed to be at least ten times lower than the pit water because of mixing and dilution with underlying groundwater."

[illegible] Ibid., p. 157

Response to Letter 16

Letter 16 Continued

Comments on Golden Sunlight Mine DEIS - Page 23

> "The HDPE liner and drain system in Tailings Impoundment No. 2 would limit seepage into the underlying native soils. The collected seepage will be continuously recycled and evaporated." "Localized failure (leaks) in the liner under Tailings Impoundment No. 2 are more likely to occur over the long-term."[11]

> ". . . . . long-term infiltration of direct precipitation through the tailings impoundment cover will be small to negligible. Once the total seepage rate is sufficiently small (less than 10 gpm) it will be pumped to the permanent water treatment plant . . . . ."[12]

Summary of Tailings Impacts to Water Quality and Water Quantity

"Because seepage from Tailings Impoundment No. 1 will be collected and treated, potential impacts to water quality are limited to the local cyanide plume associated with Tailings Impoundment No. 1."

Questions/Comments

16-39 1. What other leaks might be present in either pond, particularly in the absence of a leak detection system? Is there evidence of poor quality control in the base soils preparation (sharp objects or subsequent subsidence), synthetic liner construction or properties (improper installation, poor seaming, material defects), or did the TI 2 liner "fail" in some other manner? If the same proportionate amount of failure was applied to the Tailings Impoundment No. 2 as a whole (using the ponds as a "worst-case" indicator), what would be the estimated quantity of total leakage, its character, and the potential impacts (operational and post-mine)? Will the problem exacerbate over time as the liner "ages" (what is the expected "life" of the liner's efficacy)?

16-40 2. It appears GSM is leaving a $145 million dollar (minimum) liability for "reclamation." This is the present day cost of the lime that will potentially be required in water treatment for just the future tailings (not counting waste dumps, existing tailings, pit lake)? What is the total amount and cost of lime that may be necessary to eventually mitigate the impacts of ARD from the GSM as a whole?

16-41 3. The acid neutralization alternative would not result in the listed disadvantages if paste technology was used - as there would be no recycled water. What degree of scaling problems being anticipated and will this also be a consideration in the water treatment plant design? How does a long-term treatment system for ARD required for the pit and possibly for long-term seepage from Tailings Pond No. 1, make this separate matter disadvantageous?

16-42 4. What about frost heaving as is so common and evident in the immediate area? Mitigation W-7[13] (substituting borrow material for clay) would not be effective in this case. According to W-7 "The additional 18-inch layer of alluvial borrow material is not needed for the lined Tailings Impoundment No. 2."

16-43 5. Is the "seepage" from the same TI2 drainage pipes that aren't working properly? If seepage

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[11] Ibid., p. 266-271

[12] Ibid., p. 275

Response to Letter 16

16-39 Established construction and quality assurance/quality control (QA/QC) procedures are used for placement of the liner to prevent leaks from Impoundment No. 2. First, the liner foundation is compacted to prevent settling and all sharp objects are removed. As the liner material is placed, quality control is maintained through a documented QA/QC program that includes material and weld inspection and testing, and proper personnel training, and certification. The liner is constructed by a specialized contractor and all work is supervised by the designing engineering firm.

It was determined that the cause of seepage from the reclaim basin area was not liner failure, but an accidental tear in the liner between the starter dam and the east reclaim basin, where impoundment underdrain flow enters the basin. The liner was inadvertently damaged by a piece of GSM equipment that was temporarily operating adjacent to the basin. GSM identified and repaired the tear, and took subsequent measures to isolate the basin area from future damage by equipment.

The likelihood of extensive liner failure is remote, although small holes in the HDPE are likely to develop over the long term. However, the risk of liner leakage beneath the main impoundment will greatly diminish with time after closure because as the tailing dewaters the hydraulic head on the liner is reduced. The potential impacts of leakage through the single liner underlying the impoundment are mitigated because it was placed on 15 feet of excavated and recompacted soil, which provides a dense, reduced permeability base. The double liner system under the reclaim basins has an intermediate leak detection layer.

As stated in the Draft EIS (page 272), leaks in the impoundment or reclaim liner systems would be detected and controlled by appropriate monitoring/pumpback well systems under implementation of Mitigation Measure W-8. Draft EIS Appendix A also provides contingency measures to prevent impacts to groundwater quality should leakage ever occur.

16-40 The acid neutralization alternative for Impoundment No. 2 and the long-term water treatment system are two distinctly different processes with different objectives and different lime requirements. The acid neutralization alternative was a method to be applied to a tailing/water slurry, while the water treatment plant is intended for pit and other groundwater.

After the tailing is dewatered, less than 10 gpm of infiltration recharge would be captured and treated. The lime requirement to treat this water, assuming it is not directed to an alternative treatment system, is totally different and much less than the lime required for tailing neutralization. The actual lime consumption for the water treatment system will depend on influent water quality and flow rate. Appendix A describes the lime requirements and costs for long-term water treatment at GSM.

Response to Letter 16

16-41 Refer to the response to Comment 16-17 for a discussion of why paste technology is not considered practical or feasible for use at the Golden Sunlight Mine. In addition, even if the scaling problems of recycled water were eliminated, the Acid Neutralization Alternative would still be disadvantageous for the other reasons cited in Section II.C.3. It has been determined that water treatment provides the most practical approach to managing ARD concerns at GSM over the long-term.

Potential scaling problems have been evaluated and were addressed in the preliminary water treatment plant design in Appendix A.

16-42 The agencies' personnel were advised by Greg Richardson, an expert in design of containment facilities, at the Mine Design, Operations & Closure Conference held in Whitefish on April 12 through 14, 1994, and again on April 11 through 13, 1995, that clay layers used for an impermeable layer within the frost zone don't work. Based on this advice, the agencies opted to remove the 18-inch clay layer in Tailing Impoundment No. 1 and replace it with an additional layer of subsoil material borrowed from adjacent alluvial borrow sources. This 18-inch layer of borrow material would provide additional water holding capacity and rooting depth. This would provide a 66-inch layer of material for a rooting zone over the tailings. The agencies are not concerned about frost heaving in this layer. The research conducted at GSM on the tailings impoundment by MSU's Reclamation Research Unit concluded that 48 inches of cover were adequate to minimize seepage through the tailings. The agencies agreed that this is true for most storms in the area. The reason for using the additional 18 inches on Tailing Impoundment No. 1 was to provide an additional measure for seepage control from the unlined impoundment. Tailing Impoundment No. 2 is lined and has an efficient seepage collection system. In Tailing Impoundment No. 2, the agencies did not feel the additional 18 inches of cover were justified.

Letter 16 Continued

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16-43 reports to groundwater rather than through drainage pipes, what is the amount of "pumpback" water to be treated in water treatment plant? Wouldn't it be significant? Are water treatment plant requirements based on seepage, or seepage diluted by groundwater? 300 gpm water treatment plant seems insufficient in this regard (by up to a factor of 10).

__Containment__

16-44 The DEIS should provide a detailed and subjective overall evaluation of Tailing Impoundment No. 2's potential for leakage through the liner under both operational and post-mine (ARD) scenarios, quantifying potential leakage and assessing environmental impacts. Monitoring wells are not necessarily proof of leakage, but rather proof of substantial contamination of groundwater. By the time contamination is detected by monitoring wells, there is real potential for harm to humans and the environment (as demonstrated at GSM). All containment's for highly toxic substances (such as cyanide heap leach pads and ponds) should be designed to the EPA recommended performance standard of zero discharge. Design to this performance standard, which is proven to be technically and economically feasible, would typically result in a compacted low-permeability soil layer overlain by a double-liner synthetic geomembrane liner with a leak detection and evacuation system between the synthetic liners.

Bonding

According to Section __II.B.1.a. Current Mining Operations, Bonding Commitment__

Bond Amount	August 1997	$36,043,902

"As stipulated in the MMRA, the total value of the bond is reviewed every 5 years and updated to compensate for inflation or other factors as needed. The 5-year review on GSM's bond, scheduled in 1995, was delayed until completion of this EIS"[44]

__Questions/Comments__

16-45 Does this include considerations recently encountered by agencies for Pegasus bankruptcy. How will this work "in perpetuity?" What if inflationary periods, or major market crash in which "escrow" held? For this reason shouldn't "perpetuity" mitigations be considered unreasonable due to inherent uncertainties which mitigations aren't available for?

Wildlife

According to Section __II.B.1.a. Current Mining Operations, Environmental Protection Measures__ - Protection of Wildlife, ". . . . values of 25 to 50 ppm or less would have to be maintained to minimize wildlife mortalities from CN (USFS 1991)." "However, hazing and monitoring programs will continue at the same levels due to other, less acute hazards in the tailings impoundments, such as copper and other metals."

In the same section the __INCO SO_2/Air Cyanide Destruction Process__, "Beginning late 1997, GSM will operate an INCO SO_2/Air circuit to destroy cyanide in the tailings materials prior to sending them to the tailings disposal facility. The process is designed to reduce the hazards to wildlife and reduce

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[44] Text, p. 46

Response to Letter 16

16-43 The drain system in Impoundment No. 2 is functioning as designed. The drain system is constructed on top of the HDPE liner and therefore seepage from the drain system to groundwater would not occur. Also, the impoundment is constructed and lined such that water emerging from the consolidating tailing materials collects on the liner and drains towards the embankment underdrains and lined reclaim basins. If the drains cease to function over the long-term, any infiltration accumulating in the impoundment area would migrate through the sandy embankment material and would still report to the reclaim area, both of which are underlain by HDPE liner and compacted clay material. The water management plan in Appendix A evaluates contingency inflows to the water treatment plant in the event that leakage occurs from isolated locations beneath the impoundment. Large scale failure of the lining systems is highly unlikely.

16-44 The potential for leakage from Impoundment No. 2 during operations and post-closure is discussed in detail in Draft EIS Section IV.B. The conclusion in the comment letter incorrectly assumes that monitoring wells are not an effective pollution prevention tool. In practice, the use of monitoring wells enables early detection of low concentrations of seepage so that corrective actions can be taken to prevent harm to human health and the environment.

The containment systems at GSM are designed to comply with Montana water quality protection regulations. The liner system for Impoundment No. 2 includes 80 mil HDPE underlain by compacted clay-rich material. The current water management plan, which includes groundwater monitoring wells, groundwater capture and pump-back mitigation measures, and utilization of a mixing zone to protect beneficial uses and enable compliance, is consistent with Montana law.

16-45 Please see the Responses to Comments 2-28 and 16-31.

Letter 16 Continued

Comments on Golden Sunlight Mine DEIS - Page 27

the risks of groundwater contamination associated with cyanide in the tailings impoundments." "Testing on slurries at Golden Sunlight Mine has shown that effluent WAD CN concentration below 5 ppm are achievable. It is likely that concentrations of at least 30 ppm or below will be achieved." "Construction of the system was scheduled to be completed in late 1997, with start-up proceeding immediately thereafter. The supernatant pond is expected to achieve concentration levels considered safe for wildlife approximately 6 months to a year following start-up (early to mid 1998)."

According to Section III.E.1.a, Waterfowl, Waders, and Shorebirds, "Waterfowl use of the Jefferson and Boulder Rivers is substantial, and documentation of waterfowl at the mine site includes observations of birds flying over the study area and extensive records of birds attempting to land on the tailings ponds."

In Section II.C.2, Cyanide Neutralization Alternatives the DEIS says, "Impoundment No. 2 was designed to limit ponded water by a series of drains through the embankment. Impoundment No. 1 was unlined and had no special drains to limit surface ponding. As a result, Impoundment No. 1 had up to 64.3 acres of ponded water that had to be patrolled until the pond was decommissioned and cyanide was reduced to 30 ppm. Impoundment No. 2 has been in operation since 1993. The amount of ponded water was to be limited to approximately 41.3 acres limiting the amount of wildlife hazing needed for all but shorebirds. The amount of ponded water has been larger than planned because of clogging of the drains. Several attempts have been made to increase drain function. GSM continues to assess drain improvement options. Meanwhile wildlife hazing efforts have been increased to prevent bird losses in the pond until the INCO/SO_2 air circuit is installed."

Questions/Comments

16-46
1. Other documentation indicates cyanide tolerance may be significantly less than 25 ppm, particularly for "stressed" waterfowl. If hazing is still necessary due to metals, is cyanide destruction being performed due to concerns about liner leakage, or for some other reason? Hazing, where it has been performed for long periods of time, tends to reduce in effectiveness. Why not eliminate both risks - lower cyanide and use paste technology? Why difference between achievable and achieved - no commitment to use best practices?

16-47
2. How big is No. 2 pond - is this why cyanide destruct was installed? Shows how mitigations might not work, requiring additional mitigations for which bonding is insufficient. If drains not working, how will they drain ARD as inferred in other sections (meaning ARD leaks through liner or daylights elsewhere)?

Ibid., p. 34

Ibid., p. 176

Ibid., p. 104

Response to Letter 16

16-46 As stated in Section II.B.1.a under "Environmental Protection Measures," hazards of metals are less acute than cyanide. The INCO cyanide destruction system was implemented in order to minimize risk in the impoundment area, in accordance with GSM's corporate policy. GSM's Environmental Management Policy states that risk reduction in the tailing area will remain a high environmental management priority. The INCO cyanide destruction system is consistent with the use of best management practices. GSM will continue to use best management practices to minimize environmental risk to the lowest extent practical.

No data was cited in the comment to support the assertion that cyanide tolerance of wildlife is "significantly less than 25 ppm" or that "the effectiveness of hazing reduces over time. As stated in Section II.C.2 (page 104), "Since 1991, annual bird mortalities from exposure to tailings cyanide have been kept below 1 percent of the total number of birds hazed."

Paste technology is addressed in the Response to Comment 16-17.

16-47 See the Response to Comment 16-46 for an explanation of why the INCO system was installed. The underdrain system for Impoundment No. 2 is currently functioning according to the design, and seepage is effectively being routed to the reclaim basin area. After the impoundment is decommissioned and the tailing dewatered, any infiltration into the reclamation cover material will continue to report to the underdrain system. If the drains cease to function over the long-term, any infiltration accumulating in the impoundment area will migrate through the sandy embankment material and report to the reclaim area, both of which are underlain by HDPE liner and compacted clay material. GSM remains committed to minimizing environmental risks associated with its operations, and the water management plan in Appendix A describes a number of contingency measures to address long-term conditions.

Letter 16 Continued

Comments on Golden Sunlight Mine DEIS - Page 28

Purpose and Need

Concerning Section I.C., Purpose and Need for Proposed Action"[47]

Questions/Comments

16-48 Table I-2 is purposefully deceiving. By emphasizing "secondary" uses of gold as indicated by quantity of text included it doesn't indicate that the most common uses (>90%) are for Jewelry and Currency. To provide objectivity the DEIS should include the statement that other uses could be satisfied by only by-product gold or recycling (or present stockpiles would last over 600 years if no there was not new production for these purposes). Without demand for gold, is there a purpose and need?

Economics and Reasonably Foreseeable Future Actions

According to Section II.A.1. Hard Rock Geology and Mineral Resources, "Total reserves at Golden Sunlight Mine, including those mined since 1983, include approximately 55 million short tons grading 0.059 ounce of gold per ton, with an average waste:ore stripping ratio of 7.4:1. The mine currently has an active exploration program to identify additional reserves. Exploration of additional ore at depth within the breccia pipe is largely dependent upon gold prices and operating costs."[48]

Questions/Comments

16-49 The GSM mine has gone through numerous modifications and associated impacts in its 15 year operating history, most of which now appear to have been reasonably foreseeable and highly significant despite not having been assessed in any previous EIS. How reasonably foreseeable is additional mining, with only 6 - 7 years of mine life under the proposed action, which was submitted almost 7 years ago? How might the reasonably foreseeable long term downturn in the

16-50 price of gold effect foreseeable actions (such as premature closure or actions related to high-grading), and would those have an effect on purpose and need?

Paleontological Resources

According to Section II.A.3. Paleontological Resources, "One important fossil site is located in Pleistocene-age alluvial deposits north of the existing East Waste Rock Dump disturbance boundaries in the Sheep Rock area. Pleistocene fossils, including cheetah, horse, camel, and mountain sheep have been found in this locality. This site is significant because the paleo-fauna of that period are not common to this area, and new localities could identify associations with and artifacts from Paleo-Indian cultures in the area."[49]

and in Section II.L. Cultural Resources, "Two of the springs (site 24JF717 and 24JF282; the Sheep Rock site) show evidence of human use dating back 8,000 years B.P. or more."

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[47] Ibid., p. 23.

[48] Ibid., p. 121.

[49] Ibid., p. 138.

Response to Letter 16

16-48 The purpose of the table was to list some of the commercial uses of gold, not to assign importance to any particular use. The agencies are legally bound to respond to gold-mine permit applications whether or not society has a need for the product, and MDEQ was specifically ordered by the court to prepare an EIS for GSM's proposal.

16-49 &

16-50 Both MDEQ under MEPA rules and BLM under NEPA regulations are required to include cumulative impacts in an EIS. MEPA rules define cumulative impacts to include the collective impact of past and present actions and actions under concurrent agency consideration in the same geographic area. The NEPA regulations, on the other hand, define cumulative impacts to include past, present, and "reasonably foreseeable future" actions. Therefore, the concept of reasonable foreseeability is relevant to the Golden Sunlight Mine EIS for purposes of BLM's obligations under NEPA.

Although it is possible that GSM may propose an expansion in the future, it is not possible to determine the likelihood that this will occur because of the variables involved. These variables include the nature of the reserves, the price of gold, mining costs, environmental compliance costs, reclamation costs, and regulatory restrictions. Mining and reclamation costs vary as new technology is developed. It appears that, given today's gold price, technology, and costs, GSM has proposed to mine all deposits that are reasonably foreseeable to be mined. Future expansion is therefore not reasonably foreseeable as that term is used in the context of the National Environmental Policy Act.

Furthermore, it is not possible to meaningfully evaluate the impacts of, or reasonable alternatives to, a future expansion. Because a future expansion will require a permit amendment, the impacts of any future proposal will be evaluated pursuant to both MEPA and NEPA before a further expansion occurs.

Letter 16 Continued

Comments on Golden Sunlight Mine DEIS - Page 23

"Site 24JF292 was identified as a significant site eligible to the NRHP, based on its potential to yield data relating to spatial patterning, lithic technology, and subsistence patterns. The site was found to contain 5 to 10 buried cultural levels and significant paleontological deposits."[illegible]

Questions/Comments

16-51 From the information given these sights have potential for significance. What has already been impacted (either buried or otherwise) from past mining? Has impact by mine in some way been significant as inferred? Have violations of the Antiquities Protection Act occurred, and if so, what legal actions are being taken against the mine or individuals?

State Trust Lands

According to Section II.B.1.a. Current Mining Operations, "The mine permit boundary encompasses . . . , and 80 acres of state school trust land." "A total of 357 acres of disturbance will occur over state school trust subsurface lands with 248 acres of sulfide-covered disturbance, and 110 acres of non-sulfide covered disturbance."[illegible]

Questions/Comments

16-52 Why the difference in acreages? What is state lease payment? How are lands being managed for long-term value? Are these state lands dedicated to a particular institution?

[illegible] Ibid., p. 216-225.

[illegible] Ibid., p. 29.

Response to Letter 16

16-51 Refer to Sections IV.A.1.b and IV.L.1 of the Draft EIS for a description of impacts from past mining on paleontological and cultural resources. No identified potentially significant sites have been affected by past mining, and no violations of the Antiquities Protection Act have occurred. As stated in Section IV.L.1, the Section 106 consultation with the SHPO conducted in 1996 and 1997 concluded that completion of currently permitted mining activities would have no effect on potentially significant sites. As part of the consultation, GSM agreed to reroute haul roads and redesign waste rock dumps to avoid affecting sites. In addition, GSM has supported further evaluation of the resource by sponsoring MSU research at the Sheep Rock site.

16-52 The acreage numbers cited are different because they are referring to different things. The figure of 80 acres refers to state school trust surface land. The figure of 357 acres refers to state school trust subsurface lands.

GSM holds three State of Montana nonmetalliferous leases for limestone in the vicinity of the mine. These leases are located in Sections 16, 17, and 21, T2N, R3W. The annual rental payment on these leases is $3.00 per acre for a total of $4,320. GSM holds seven State of Montana metalliferous leases for gold and silver in the vicinity of the mine. These leases are located in Sections 16, 17, 20, 21, 28, and 33, T2N, R3W, and Section 36, T2N, R4W. The annual rental payment on these leases is $3.00 per acre, except for Section 16, which is $2.50 per acre. The rental payments for these leases total $7,855.30.

Montana school trust lands are managed by the Montana Board of Land Commissioners and DNRC pursuant to the Enabling Act of February 22, 1889, state statutes, and administrative rules. Under the preferred alternative, a soil stockpile is proposed to be placed on Section 16. GSM must obtain a land use license through the Central Land Office of DNRC before this temporary disturbance is made. No other state surface land would be disturbed, and future uses would be determined by DNRC. DNRC has concluded that commercial/economic metalliferous and/or nonmetalliferous mineral deposits are not present in those portions of the state mineral estate that would be affected by the preferred alternative.

As stated in Section I.C.2.c on page 21, the DNRC administers state school trust lands for the benefit of the state school trust. Refer to this section for more details.

Letter 16A

NATIONAL WILDLIFE FEDERATION®
People and Nature: Our Future Is in the Balance

Northern Rockies Natural Resource Center

RECEIVED
NOV 25 1997
DEQ

Mark Simonich, Director
Montana Dept. of Environmental Quality
1520 E. Sixth Ave.
Helena, MT 59620-0901

Dear Director Simonich:

I represent the National Wildlife Federation, the Montana Environmental Information Center, the Mineral Policy Center, the Sierra Club and the Gallatin Wildlife Association. These organizations successfully challenged the Golden Sunlight expansion in 1992 and this case remained under the jurisdiction of Montana District Court in Helena. As part of the settlement of this litigation, we have worked with DEQ since 1995 to develop a new EIS on which to base a mining permit. While we believe our work helped lay the foundation for a solid and legally sufficient EIS, in the last months of the process DEQ unilaterally abandoned a cooperative approach and developed several critically important components of the EIS without any independent oversight. Predictably, DEQ's recent work on the EIS was intended solely to benefit Golden Sunlight and to shield operations at the mine from meaningful public review. As a result, the EIS is fatally flawed and should be withdrawn.

16A-1 In our litigation against Golden Sunlight, Judge Honzel held in 1994 that the original EIS prepared on the mine expansion was inadequate and illegal. More significantly, the Judge also held that the pit reclamation exemption found in the MMRA was unconstitutional under the Montana Constitution. *See National Wildlife Federation, et al., v. Montana Department of State Lands, et al.*, Cause No. CDV-92-486, Sept. 1, 1994. As a result of this holding, the Legislature amended the MMRA in 1995 to require pit reclamation "to the extent feasible." *See* 82-4-336(7), MCA. Nowhere in the amended statute is there any suggestion that economic feasibility was to be considered in evaluating pit reclamation, nor has the Department ever promulgated regulations which define how such an economic test might be developed or applied.

In developing a new EIS for the mine, my clients insisted that pit reclamation be examined as an option. As a result, the DEIS issued last week has a partial pit backfill alternative which is technically feasible to implement and which would reclaim 235 acres more land than DEQ's preferred option. But rather than adopt the partial pit backfill alternative, as the law would seem to require, DEQ has, within the last few months, developed an economic feasibility test which has never been publicly reviewed, and commissioned a secret economic analysis of the Golden Sunlight expansion. Based on this test and on this analysis, DEQ has chosen to reject the partial pit backfill reclamation alternative.

240 N. Higgins, Suite 2, Missoula, MT 59802-4443 Tel: 406-721-6705 Fax: 406-721-6714 Website: http://www.nwf.org/

Response to Letter 16A

16A-1 The requirements for the content of a draft environmental impact statement are contained in ARM 17.4.617 and 40 C. F. R. Part 1500. Generally, those provisions require the agencies to: describe the existing environment; describe the impacts of the proposed operation on the existing environment; develop reasonable alternatives to mitigate significant impacts; describe the impacts of the alternatives; and describe irreversible and irretrievable commitments of resources, economic and environmental costs and benefits, and the relationship between local short-term uses of the environment and the long-term productivity of the environment. The commentor does not indicate that the DEIS does not meet any of these requirements.

Section 82-4-336(7) requires that the operator must reclaim disturbed land to comparable utility and stability as that of adjacent areas, "except for open pits and rock faces that may not be feasible to reclaim in the same fashion as other disturbed lands." For these lands, it required that the land be reclaimed to a condition that affords utility to humans and the surrounding natural system "to the extent feasible" and that blends in appearance with surrounding land "to the extent feasible." To implement this statute, it is necessary to determine what the Legislature meant when it required reclamation to certain conditions "to the extent feasible." The commentor is correct that the language of the statute does not mention economic feasibility. In fact, the Legislature used no adjective to modify "feasible." It did not use "technically," the adjective used by the commentor, either. This makes the statute ambiguous. Court opinions regarding interpretation of ambiguous statutes state that an agency is to look to the legislative history of an ambiguous statute. The legislative history of the statute in question is contained in the statement of intent that accompanied the bill that became the statute. The statement of intent indicates that the Department, in determining whether to require pit backfilling, is to consider both the effect of imposing that requirement on mining and the production of minerals and the effect on the environment of not requiring the backfill. This indicates that the Department is to consider the economic feasibility of pit backfilling and the environmental impacts of not requiring it.

Letter 16A Continued

16A-1 According to the DEIS, DEQ has unilaterally decided that the test for reclamation alternatives is whether they provide a positive return on investment to mining companies.[1] *See* DEIS at xxvii. As noted, there is absolutely no legal basis for this policy decision in the Metal Mine Reclamation Act, and it has never been subjected to any form of rulemaking or other administrative review process. DEQ then applied its return on investment test to Golden Sunlight not by conducting its own analysis, but by having an outside accountant review economic data provided by Golden Sunlight. *See* DEIS at xxvii. This information provided by GSM and the analysis conducted by the accountant have never been reviewed by DEQ because DEQ does not want this information available to the public. Based on this secret analysis which it has not even examined, DEQ rejected the partial pit backfill option as the preferred alternative.

16A-2 The Montana Constitution in Article II, Section 9, guarantees the public the right to see all government information. This "right to know" provision is fundamental to the operation of our state government. *See also*, 2-6-101, et seq., MCA. Similarly, the Constitution guarantees to every Montana citizen the right to a clean and healthful environment and commands that all mined lands be reclaimed. *See* Article II, Section 3; Article IX, Section 2. DEQ has deliberately chosen to ignore these constitutional guarantees by unilaterally adopting a reclamation definition which is at odds with the law, and then deliberately hiding its analysis of reclamation feasibility from the public. It is difficult to imagine more outrageous governmental conduct.

My clients and I fully recognize that the Golden Sunlight EIS is only a draft document that can change as a result of public comment. Nonetheless, we find the problems surrounding the reclamation analysis to be so fundamental as to require DEQ to withdraw the DEIS. Until such time as DEQ provides the public with an opportunity to review its definition of reclamation feasibility under the MMRA and produces a full and open evaluation of economic feasibility, public review of the DEIS cannot take place in any meaningful fashion.

I look forward to your prompt response to these concerns.

With best regards,

Tom France

Thomas M. France, Esq.

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[1] The return on investment test is apparently a different standard than applied to the Zortman-Landusky mine expansion last year. At Zortman-Landusky, DEQ never examined return on investment, but it did reject pit backfill alternatives because it concluded that the double-handling of waste rock materials would be too expensive.

Response to Letter 16A

16A-2 In determining whether the Partial Backfill Alternative would render the operation uneconomic, MDEQ obtained engineering data from which it estimated the cost of partially backfilling the pit and reclaiming it. This information is available to the public. MDEQ also obtained from GSM data to enable MDEQ to make return-on-investment projections. That information is proprietary in nature and therefore subject to a right of privacy. MDEQ has determined that GSM's right to privacy clearly exceeds the merits of public disclosure. The information is a "trade secret", as defined in 30-14-402(4), MCA.

Letter 17

Tamara J. Johnson
P.O. Box 624
Whitehall, Montana 59759

RECEIVED
JAN 21 1998

January 19, 1998

Mr. Greg Hallsten
Montana Department of Environmental Quality
P.O. Box 200901
Helena, MT 59620-0901

Mr. Dave Williams
Bureau of Land Management - Butte District
P.O. Box 3388
Butte, MT 59702

Dear Mr. Hallsten and Mr. Williams:

Thank you for the opportunity to submit comment on the Draft Environmental Impact Statement for Golden Sunlight Mine, issued in November of this year.

I believe the Draft Environmental Impact Statement provides a complete investigation of Golden Sunlight Mine's proposed action to extend the life of its mine, as well as a thorough review of environmental impacts associated with the issues raised by the 1994 District Court decision and the subsequent settlement agreement dated February 7, 1995.

17-1 However, the Draft EIS Summary language fails in the discussion of rationale for dismissal of the partial backfill alternative. While I agree with the conclusion of the agency preferred alternative, which does not include partial backfilling, I totally disagree with the language and rationale on page xxvi and xxvii of the Summary. Any backfilling alternative must be analyzed based on a number of criteria, which includes economics. One of the primary issues before the Montana Department of Environmental Quality and other participating agencies, must be the environmental impacts or lack thereof, when considering backfill alternatives.

The Metal Mine Reclamation Act has been amended twice by the Montana Legislature with a keen eye on the District Court's opinion on Amendment 008 to GSM's Operating Permit 00065. The Montana Legislature, carefully and deliberately has put into law, criteria for open pits created by the mining process. Therefore, it is critical to adhere to the statute and its statement of intent while analyzing and choosing a preferred alternative when preparing an environmental impact statement.

Response to Letter 17

17-1 Comment noted. Please see the Responses to Comments 16-37 and 23-5.

Letter 17 Continued

Specifically, the language used in the Summary should reflect all considerations made by the agencies, not just economics. The Montana DEQ has taken a careful and thorough look at all considerations elsewhere in the document but has simply neglected to include the dialogue in its Summary discussions.

In the case of Golden Sunlight Mine's open pit reclamation plan, the environment is given more than ample consideration and protection. GSM's reclamation plan complies with MMRA requirements and the partial backfill alternative has demonstrated negligible benefit to the environment. When all factors are considered, the environment and the health and safety of Montana citizens is better served by not backfilling the pit at all.

Backfilling the pit at GSM will not stop all infiltration of water. Water removal and treatment will be necessary under any of the considered alternatives. Further, placing broken sulfide-bearing rock, that has been exposed to air and water, back into the pit, is not advisable when it is certain that this material will come into contact with water. Any fill taken from waste rock piles is susceptible to generation of objectionable effluents. Rather than eliminating objectionable effluents as required by law, backfilling may increase the likelihood of this occurring below the surface. Additionally, requiring backfilling on any scale, may require additional disturbance of land elsewhere to provide the soil medium for capping and revegetation.

17-1 Exposure of pit rock faces to sunlight and air will enhance evaporation of water. Over time, the rock faces will resemble natural formations that are found in the surrounding area. In addition leaving the pit open allows any water that occurs as seeps to drain into the pit bottom where it can be captured and treated. Golden Sunlight Mine remains committed to water treatment to a level safe to humans and the environment and has guaranteed this treatment by the posting of a bond to ensure that adequate funds are available to the State of Montana to continue treatment in perpetuity after reclamation has been completed and the site is no longer being actively operated. Additional safety measures will be taken to enclose the pit and prevent access by people or wildlife.

Pit backfilling is not, in and of itself, environmentally benign when you consider that double handling of rock would require, in the case of GSM, the consumption of an additional 18 million gallons of refined fossil fuels, would increase air emissions both from the burning of the fuels and the particulate matter resulting from re-digging, dumping, road dust, etc. There is also an additional safety risk to employees in backfilling a pit. These on and offsite environmental impacts and safety factors must also be considered.

Future use of GSM's open pit has been adequately addressed and planned for within the Draft EIS and wildlife habitat for raptors will be preserved and habitat for bats will actually be created. By choosing the "No Pit Pond Alternative" as the preferred alternative, the threat to bats or birds of coming into contact with pit water of poor quality, has been eliminated.

GSM EIS Comments, Page 2

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Response to Letter 17

Letter 17 Continued

17-1 The language used in a public document must clearly state the agencies complete analysis of any backfilling alternative and the rationale for its acceptance or lack thereof of that alternative. The issue must be the environmental concerns as well as the public's health and safety.

As a final comment, I encourage you to continue the work on this EIS and proceed to a final document and a record of decision in a timely manner. The future of GSM and its employees is, at this point, dependent upon the timely issuance of this permit.

Thank you for your consideration of these comments.

Respectfully yours,

Tamara J. Johnson

Tamara J. Johnson

Response to Letter 17

Letter 18

International Union of Operating Engineers
Affiliated with AFL-CIO

Local 400

JIM KEANE
President

[illegible]
Vice President

[illegible]
Treasurer

[illegible]
[illegible]

JOHN C. "JACK" CALDWELL
Business Manager &
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Montana

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JAN 21 1998
MT. DEPT OF ENV. QUALITY
PERMITTING & COMPLIANCE DIV.

January 16, 1998

Mr. Greg Hallsten
MDEQ
P.O. Box 200901
Helena, MT 59620-0901

International Union of Operating Engineers, Local 400 fully supports adopting the draft environmental impact statement for the Golden Sunlight Mine in Jefferson County.

Golden Sunghlight since its beginning in 1982, has been a responsible stewart of its use of land in Montana. It has also provided good paying jobs directly related to the mining of gold, one of the precious resources God has bestowed on the state of Montana. It has also provided high paying jobs in construction of its facilities which was supported by the Southwest Building Trades. It is also important that the taxes paid by this outstanding corporation have provided employment for numerous tax supported positions in both state and local economies. Our 1,950 members directly benefit though the construction of roads and other info-structure required to support the families created by Golden Sunlight's development of this valuable natural resource. We also must remember that this mine supports numerous off-mine positions, off-mine jobs, related to supplying the mine with the materials needed to maintain its day to day operation.

The Environmental Impact Statement has been reviewed by all sides and it is time that your agency implement EIS so that a record of decision can be issued to the Golden Sunlight Mine. The Operating Engineers Local 400 also feel that the pit backfill alternative is a total waste of time and money and just another tactic, mine opponents are using to destroy the development of any new mining properties in Montana.

Once again the members of the IUOE Local 400, supports the adoption of the EIS for the Golden Sunlight Mine without delay.

Sincerely,

Jim Keane

Jim Keane, President

Response to Letter 18

Thank you for your letter. No response necessary.

Letter 19

MCA Montana Contractors' Association Inc.
A Chapter of the Associated General Contractors of America
Mike Foster, executive director

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FEB 04 1998
MT. DEPT OF ENV QUALITY
PERMITTING & COMPLIANCE DIV

February 3, 1998

Greg Hallsten
Montana Department of Environmental Quality
P.O. Box 200901
Helena, MT 59620-0901

Dear Mr. Hallsten:

The Montana Contractors' Association is aware that Golden Sunlight Mine in Jefferson County has applied for a permit to continue operating. Our organization stands in strong support of Golden Sunlight Mine in this endeavor.

The MCA believes that Golden Sunlight Mine has an impressive operating record that has included a responsible approach toward the environment, its neighbors, and its community. The mine has strong support from the people of Whitehall and Jefferson County, which reflects the mine's outstanding efforts.

Please reward the excellent record of Golden Sunlight Mine by issuing a permit allowing the proposed extension of mining prior to completion of the work authorized by its current permit.

Thank you for your time and consideration.

Sincerely,

Mike Foster

Mike Foster, Executive Director

MLF:dd

cc: Mark Simonich, Director of MDEQ
Dave Williams, Bureau of Land Management

Telephone (406) 442-4162
Fax phone (406) 449-3199
E-mail mcassn@aol.com

1717 11th Avenue, Post Office Box 4519,
Helena, Mont. 59604

Response to Letter 19

Thank you for your letter. No response necessary.

Letter 20

MONTANA MINING Association

2301 Colonial Drive
Helena, Montana 59601
Phone (406) 443-7297
FAX (406) 443-7299

OFFICERS

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Past President
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Montana Mining Association
Helena, MT

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MT DEPT OF ENV QUALITY
PERMITTING & COMPLIANCE DIV

Mr. Greg Hallsten
DEQ
Impact Assessment Bureau
P.O. Box 200901
Helena, Montana 59620

December 29, 1997

Dear Mr. Hallsten:

The Montana Mining Association would like to go on record in support of granting an Expansion Permit to Golden Sunlight Mine. (O.P. # 00065)

We believe that the draft EIS adequately identified the environmental impacts of the proposed activities and provided a fair and complete analyses of the various alternatives which could be pursued at the site.

We also believe that the Mixing Zone Analysis and Water Management Plan prepared by Golden Sunlight will provide adequate protection for down stream users and water quality in general.

Golden Sunlight employs more than 200 individuals whose continued employment is dependent upon expeditious approval of this expansion permit. Most of the small businesses in Whitehall depend upon the mine and the mine's employees for substantial parts of their income. Both would be seriously impacted if approval is delayed or denied.

The management of Golden Sunlight is one of the most professional and forward thinking of any mine in the state. They consistently do

Response to Letter 20

Thank you for your letter. No response necessary.

Letter 20 Continued

MONTANA
MINING
Association

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more than is required to satisfy and comply with government regulations and truly believe in promoting and maintaining the quality of Montana's environment. This company has worked to re-establish and reintroduced wildlife species, provided wildlife habitat and given the public access to lands surrounding the mine.

It is our hope that you will grant this expansion permit. We appreciate the opportunity to comment and your consideration.

Sincerely,

Jill Andrews

Jill Andrews

Response to Letter 20

Letter 21

MONTANA PETROLEUM ASSOCIATION
A Division of the
Rocky Mountain Oil and Gas Association

[illegible] Last Chance Gulch, Suite [illegible]
Post Office Box [illegible]
Helena, Montana [illegible]

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Gail Abercrombie
Executive Director

January 21, 1998

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MT. DEPT OF ENV. QUALITY
PERMITTING & COMPLIANCE DIV.

G. P. Hallsten
Montana Dept. of Environmental Quality
P. O. Box 200901
Helena, MT 59620-0901

Dear Mr. Hallsten:

The Montana Petroleum Association is in support of the mine expansion permit application of the Golden Sunlight Mine.

The findings of the draft environmental impact statement document the soundness of a decision to go forward with mining of a valuable asset and affirm that the proposed reclamation plan meets legal requirements.

The economic benefits to the state and local area from the mine's activities are impressive, and our industry has been a recipient of the ripple effect of their investments.

The Golden Sunlight Mine management and staff have been exceptional stewards of the lands. With their attitudes toward resource production and environmental protection, we are fortunate to have them doing business in Montana.

Sincerely,

Gail Abercrombie

c: M. A. Simonich
D. Williams

Response to Letter 21

Thank you for your letter. No response necessary.

Letter 22

[redacted]
Aspen Court, 33 South Last Chance Gulch, Suite 2B
Helena, Montana 59601
Phone (406) 443-[illegible]
Fax # 443-[illegible]

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JAN 22 1998
MT DEPT OF ENV QUALITY
PERMITTING & COMPLIANCE DIV.

January 19, 1998

Greg Hallsten
Montana Department of Environmental Quality
P.O. Box 200901
Helena, Mt. 59620-0901

Dear Mr. Hallsten:

On behalf of the Western Environmental Trade Association, I am writing to support Golden Sunlight Mine's application for a permit to keep operating. WETA, organized in 1976, is a coalition of representatives of agriculture, labor, business, commercial industry, the scientific community, recreation, transportation and other trade associations with an interest in promoting the economic well being of the people of Montana while protecting the state's environment.

Golden Sunlight has consistently demonstrated that a responsible mine operation can indeed be carried out in an environmentally responsible manner. The mine's management and workers have worked hard to meet environmental protection goals. The planned use of new reclamation methods in the company's plan is an excellent example of Golden Sunlight's commitment to set a higher standard for modern day mining in Montana. The fact that the proposal actually goes beyond the state reclamation requirements is a significant indication that the commitment to responsible stewardship is an integral part of the way the company does business.

It is important that the mine's proposal to extend its operating life be approved for many reasons, some of which are:

- It will keep a well paid work force of over 200 employees on the job with an annual payroll that exceeds $10 million.
- Over $ 30 million is spent annually on goods and services, with the $18 million spent directly in Montana supporting hundreds of employees who do not work for the mine.
- The over $1 million paid in annual production and property taxes, along with another $1 million in payroll taxes, benefit all Montana citizens.

Response to Letter 22

Thank you for your letter. No response necessary.

Letter 22 Continued

Not only is the mine's ability to keep operating vital to the families whose livelihoods are directly and indirectly dependent on the mine, but it will also be good news for the economy of the area and the state. Those who work for and receive paychecks from Golden Sunlight not only enjoy living in the state but also like to hunt, fish, snowmobile and pursue other forms of recreation as well. Thus, it is no surprise that on surrounding land that the mine has acquired, employees have extended their conservation work to improve habitat and big game wildlife populations, and worked with Montana's Department of Fish, Wildlife and Parks on the reintroduction of wild turkeys, which are thriving.

In view of Golden Sunlight's excellent record to date, along with a strong commitment to continue to operate in an environmentally responsible manner in the future, and because of all the positive impacts of the mine being able to operate, WETA strongly urges that a permit be issued as soon as possible to allow the proposed extension of their mining operation.

Sincerely,

Don Allen

Don Allen, Executive Director

Response to Letter 22

Letter 23

GOLDEN SUNLIGHT MINES, INC.

RECEIVED
JAN 05 1998

January 5, 1998

Mr. Greg Hallsten
Montana Department of
Environmental Quality
P.O. Box 200901
Helena, Montana 59620-0901

Mr. Dave Williams
Bureau of Land Management
P.O. Box 3388
Butte, Montana 59702

Re: Comments to Golden Sunlight Mine Draft EIS.

Dear Mr. Hallsten and Mr. Williams:

This letter provides technical comments from Golden Sunlight Mines, Inc. (GSM) concerning our Draft EIS. This letter will be presented to DEQ and BLM during the public hearing to be held on January 5, 1997 in Whitehall, Montana.

23-1 GSM appreciates the hard work on the part of DEQ, BLM and the various consultants who were involved in preparation of the documents. We feel that our Draft EIS is technically sound and provides a thorough analysis of potential environmental impacts from GSM's Proposed Action and alternatives. Our comments are primarily in reference to the Summary portion of the Draft EIS, and are as follows:

ADDITIONAL ISSUES, MITIGATION MEASURES, AND IMPACT CONCLUSIONS

Wildlife and Fisheries Resources
Issue: Loss of migratory bird nesting habitat

23-2 The potential use of "avoidance" under Mitigation Measure WF-4 to protect bird nesting habitat from May through July is excessive and unrealistic. The measure could preclude GSM from stripping salvage soil for waste rock placement in the expanded east dump area. This in turn would essentially force the mine to suspend operations due to lack of available dumping area. Furthermore, it would be extremely difficult if not impossible to identify all nests.

453 MT Hwy 2 East • Whitehall, Montana 59759 • 406-287-3257 • Fax 406-287-3035

Response to Letter 23

23-1 Comment noted.

23-2 The "avoidance" proposed under Mitigation Measure WF-4 to protect bird nesting habitat from May through July was proposed as a means to identify and protect bird nesting areas in response to potential impacts resulting from the proposed expansion. Timing of these activities would effectively mitigate the loss of migratory bird nesting habitat. However, GSM has taken several steps to provide potential off-site mitigation for the temporary loss of nesting habitat, including the purchase and leasing of more than 6,200 acres to the north and east of the mine area, which will be preserved as open space and wildlife habitat throughout the mine's life and beyond. The acres temporarily lost as nesting habitat are not likely to be a significant impact to those bird species known to inhabit the general vicinity of the mine.

Letter 23 Continued

23-2 GSM has already provided sufficient mitigation for any potential, temporary loss of bird nesting habitat by purchasing over 4,300 acres of off-site land and leasing an additional 1,900 acres of off-site land to preserve open space and wildlife habitat in the general vicinity of the mine. GSM also will reclaim over 2,500 acres when mining is completed, which will increase the area of permanent nesting habitat on site. The Final EIS should disclose this information so that the public fully understands the magnitude of wildlife habitat improvement effort GSM has taken and will take to mitigate its environmental impacts. Avoidance should not be included as a possible mitigation measure in the Final EIS.

AGENCY-PREFERRED ALTERNATIVE

Select Mitigation Measures

23-3 One of the mitigation measures to reduce the amount of ARD seepage that could potentially reach groundwater is to construct drains along the edges of the existing dumps before final contouring and reclamation. While this idea has merit, it will not likely result in any environmental benefit. The estimated amount of precipitation infiltration per unit dump area described in EIS Appendix J is extremely small. The term "seepage" implies a saturated condition when in fact any water that enters the reclaimed dump surface will actually migrate as an unsaturated moisture front. Therefore, any moisture that migrates vertically downward through the waste rock dumps over the long-term would probably continue to migrate vertically downward through the drain material as well. The use of groundwater capture wells and drains placed at the outside edge of waste rock toes (if surface seepage occurs), as described in EIS Appendix A, is the most practical approach to mitigate any potential impacts to water quality.

23-4 Under the same technical reasoning given above, it also is impractical to place engineered limestone drains in Sheep Rock Gulch and other ephemeral channels that would be covered by waste rock. Sheep Rock and other gulches on site are typically filled with alluvial/colluvial material that overlies less permeable bedrock or Tertiary clay-rich material. These features provide a natural collection drain that will function similarly to an engineered drain. Therefore, a more practical approach would be to place monitoring wells beyond the edge of the final dump toe within the alluvial/colluvial material. Any seepage detected in the wells could be removed by pumping if necessary. This mitigation measure is more technically feasible, and should replace the engineered drain as a mitigation measure in the Final EIS.

Pit Reclamation Feasibility

23-5 The rationale for not including the Partial Pit Backfill Alternative in the agencies' preferred alternative is valid, but should be expanded in the Final EIS. The Summary discussion in the Draft EIS accurately reflects the DEQ's analysis that shows partial pit backfilling is not economically feasible. However, the economic criterion mentioned in the Summary is not the only criterion that demonstrates why backfilling fails to meet the

Response to Letter 23

23-3 Please see the Response to Comment 2-5.

23-4 Please see the Response to Comment 2-6.

Letter 23 Continued

23-5 intent of the Metal Mine Reclamation Act. In addition, the Summary discussion needs to point out the fact that GSM's Proposed Action pit reclamation plan complies with all Metal Mine Reclamation Act requirements, and that there is minimal, if any, true environmental benefit to backfilling. The Draft EIS Summary is deficient without disclosing these key facts.

The following discussion addresses each point in the Metal Mine Reclamation Act (82-4-336, MCA) and Statement of Intent (HB 338) to explain how GSM's proposed reclamation plan adequately fulfills the statutory requirements, and why partial backfilling does not. The Summary discussion in the Final EIS for the agencies' preferred alternative and the agencies' Record of Decision should reflect this important information.

SECTION 82-4-336. RECLAMATION PLAN AND SPECIFIC RECLAMATION REQUIREMENTS.

82-4-336(1) With the exception of tailing impoundments, GSM has committed to completing its reclamation activities within the required 2-year period. In the case of tailing impoundments, DEQ has agreed that additional time is required for tailing consolidation before final reclamation can occur.

82-4-336(3) GSM will avoid accumulation of stagnant water in the mined area by continual pumping of water that enters the pit.

82-4-336(5)(a) GSM has determined that it is not economically or even technically feasible to insulate all exposed pit faces by covering with fill material. First of all, this would require GSM to temporarily store and replace (double handle) the waste rock material removed from the pit during mining, then place soil over the entire area as a vegetative growth medium. The costs involved with this work would result in a negative return on the investment made for continued operations, and therefore would render GSM's project as uneconomic.

Secondly, it is not technically possible to provide for "insulation of all faces from moisture or water contact..." The analyses in the Draft EIS indicate that some infiltration will still occur with any type of soil/rock material cover. This means that some water will come into contact with the sulfide-bearing rock that can cause objectionable effluents to form beneath the surface. In this regard, it would not be technically feasible to insulate all rock faces from contact with moisture by pit backfilling.

82-4-336(5)(c) GSM will contain objectionable effluent that enters the open pit by pumping it from the pit area. GSM will then treat the effluent to a level considered safe to humans and the environment, before it is released.

Response to Letter 23

23-5 The requirements of MMRA for pit backfill are described in the Response to Comment 16-37. Because of its finding that a partial pit backfill requirement would render the operation uneconomic, MDEQ did not evaluate in the EIS whether this requirement would preclude access to other reserves. The environmental impacts of the Partial Backfill Alternative are described in the EIS. The Record of Decision will contain the complete rationale for MDEQ's feasibility determination.

Letter 23 Continued

82-4-336(7)(d) The exposure of GSM's post-mine, rock faces to sunlight and air will enhance evaporation of water that can enter the pit (as precipitation and/or groundwater seeps) to form objectionable effluents.

82-4-336(7)(e) The pit perimeter will be bermed and fenced to prevent entrance into the open pit by persons or livestock.

82-4-336(6) GSM's Proposed Action reclamation plan requires trees to be planted around the pit perimeter and, where it can be safely performed, any final oxidized benches containing enough fine material to support plant life also will be seeded and planted with trees. In addition, trees will be planted on final benches and talus slopes where safety, stability and material quality allow. This plan fully meets GSM's reclamation objective of providing wildlife habitat for future beneficial uses of the land.

82-4-336(7)(a) GSM's post-mining open pit will meet the minimal requirements of being structurally competent to withstand geologic and climatic conditions without significant failure that would be a threat to public safety and the environment.

Initially, some rock slides are expected to occur in the post-mine pit. However, pit wall stability will increase with time as the least stable portions of the rock face settle into more stable configurations. Eventually, portions of the rock faces in the open pit will resemble the natural cliffs that are evident throughout the area of Bull Mountain.

Uncontrolled public access to the post-mine pit will not be allowed. The safety and security of authorized personnel and equipment required for post-mine maintenance activities will be ensured through measures that include inspection and monitoring of pit walls, as presently being conducted for the current mining operation.

The post-mine open pit also would allow any water that occurs behind the pit walls to freely drain towards the pit bottom, some of which, would evaporate. A backfilled pit could cause ground water levels to rise behind pit walls and create further instability or, where pit wall springs are present, the possibility exists for the backfilled wall material to become saturated and fail due to slumping.

82-4-336(7)(b) The post-mine utility (functional uses) afforded to humans and the surrounding natural systems of an open pit will be similar to the pre-GSM condition. The pre-GSM utility of the open pit area consisted of wildlife habitat and mining. The steep hillside of the area precluded activities such as livestock grazing, agriculture and most types of recreation. There was no known timber harvesting inasmuch as timber is sparse in this area of Bull Mountain.

The only recreation activities that may have occurred in the area prior to GSM's operations was hunting and wildlife viewing. However, these would have been dependent on whether the previous owners of the property allowed access to the area. Public access to the pit area has been prohibited at GSM since operations began, and

Response to Letter 23

Letter 23 Continued

would continue to be prohibited post-closure due to concerns for the safety and security of maintenance personnel and equipment that would remain in the area.

With a post-mine open pit, wildlife habitat for raptors will be preserved and habitat for bats will actually be created. A fence will be constructed around the open pit to preclude larger mammals (including humans) from entering the area of exposed rock faces. However, the total acreage of other reclaimed lands at GSM (over 2,300 acres), and the vast areas of land purchased by GSM off-site (over 4,300 acres), provide foraging habitat for larger animals and would be open for public access. The acreage of these areas greatly exceed the acreage that would afford any utility in the pit area.

A post-mine open pit at GSM also would afford educational utility for students from nearby universities in Butte, Bozeman, Dillon, and Missoula. Portions of exposed pit walls not covered by vegetation or talus material provide an excellent opportunity for students to observe and study the geologic and mining-related aspects of the site.

82-4-336(7)(c) The current reclamation plan will blend the appearance of the open pit with the surrounding area to the extent feasible using vegetation as described in 82-4-336(1) above. In time, portions of pit benches also will weather and evolve into rock faces that resemble natural cliffs in the area.

GSM's Draft EIS describes two key observation points (KOP's) used in a BLM Visual Resource Management (VRM) analysis to characterize the appearance of the site. The first KOP is located at the Whitehall exit of I-90. Since the pit is not visible from this point, it does not affect the VRM class rating. The second KOP is located on Highway 69, approximately one mile north of MT. Highway 2, where the open pit is visible.

Three characteristics help define the VRM rating from the second KOP with respect to the open pit: land and water changes, vegetation changes, and structure changes (e.g. buildings). GSM will pump water from the pit area and therefore water is not an aesthetic concern. The land surface, however, will change from the pre-mining condition. As some portions of the rock faces slide down onto the pit benches, a 1.4:1 slope will eventually form along the highwall. The difference in slope from 1.4:1 (open pit) to 2:1 (backfilled pit) will be extremely difficult to distinguish from the distance at the second KOP. In either open pit or backfilled pit scenarios, a large bowl-shaped landform will exist in the post-mine pit area. The aesthetic differences between these two types of landforms are subjective.

Vegetative cover is the other important characteristic in the VRM rating relevant to the pit area. GSM will revegetate all accessible areas of the pit that will support trees, grasses and shrubs. Over time, the vegetation is expected to spread onto areas that were not vegetated during mine closure.

82-4-336(8) Post-mine public safety for the open pit will be ensured through fences, locked gates, warning signs, and on-site maintenance personnel. There also will be

Response to Letter 23

Letter 23 Continued

sufficient measures to prevent the pollution of air and water and prevent degradation of adjacent lands from the open pit.

Under any pit reclamation scenario, it will be necessary to pump water from the pit area to prevent migration of objectionable effluent that can form when water (either from precipitation infiltration or groundwater inflow) comes into contact with sulfide-bearing rock. For the proposed action with a pit pond, an estimated 34 gpm will need to be removed from the pit area. Under the no pit pond (open pit) alternative, an estimated 102 gpm would need to be removed. Under the partial pit backfill alternative, an estimated 47 gpm (ignoring the rate of infiltration into the cover material) would need to be removed.

82-4-336(10) Precipitation runoff into the post-mine pit will be minimized by berms and diversions around the pit perimeter. Pit area groundwater will be controlled by pumping.

HB 338 STATEMENT OF INTENT

The basic requirements of Metal Mine Reclamation Act reclamation plans are to return the lands to structural stability, and be protective of air and water quality. Further reclamation of open pits and rock faces are to provide functional uses and to blend with surrounding areas to the extent feasible [82-4-336(7)]. In determining feasibility of further reclamation, the statement of intent of HB 338 directs DEQ to consider and give effect to each of the following objectives:

(1) encourage mining in Montana,
(2) encourage production of minerals,
(3) encourage reclamation to an aesthetically unobtrusive condition,
(4) encourage reclamation to functional uses including livestock grazing, agriculture, timber, recreation, wildlife habitat, and other industrial uses including mining,
(5) discourage requirements that foreclose future mineral access not developed by current mining, and
(6) discourage requirements that generate undesirable offsite environmental impacts

GSM has evaluated both open pit and partial backfill scenarios and believes that its Proposed Action pit reclamation plan will comply with the six objectives. However, the partial backfill will not meet the objectives due to the reasons given below:

(1) Requiring partial backfill will result in a negative return on investment for GSM and force a premature mine closure. This does not encourage mining in Montana.

(2) Requiring partial backfill will force GSM to abandon its proposed Stage 5 mine plan. This is a loss of approximately 400,000 ounces of gold in GSM's current Stage 5 ore reserve that would be left in the ground and covered by backfill material. The gold mineralization that exists outside of the Stage 5 mine plan also would be lost due to the presence of the backfill material.

Response to Letter 23

Letter 23 Continued

(3) The qualitative and quantitative differences in aesthetics between a partial backfilled pit and an open pit are difficult to measure, and therefore will be subjective. Both scenarios result in a similar bowl-shaped landform with similar slope angles. The apparent differences that are initially obvious would tend to less pronounced over time as the exposed rock faces of the open pit weather into rock cliffs and talus slopes, and revegetation occurs. Aesthetic qualities also are mentioned in the discussion to Section 82-4-336(7)(c) above.

(4) The functional uses of either open pit or partially backfilled pit will be similar to the pre-GSM condition. See discussion to Section 82-4-336(7)(c) above.

(5) A partial backfilled pit would foreclose future access to the underlying minerals. Significant mining costs would be incurred to remove the backfill and recover the remaining reserves. Assuming a future gold price of $475 per ounce, approximately 635,000 ounces of gold would remain beneath the backfilled pit.

(6) The on-site environmental impact from either an open pit or a partially backfilled pit is similar. In both cases, the disturbance to the ground surface at GSM (e.g. dump footprints, roads, buildings, etc.) is identical. At closure, the partial backfill could create offsite impacts due to dust emissions from excavating and placing material. Other off-site impacts would include consumption and burning of fossil fuel required for loading and hauling backfill, and disturbance to new topsoil borrow areas.

The above information demonstrates that GSM's reclamation plan for its open pit will adequately satisfy the conditions of Section 82-4-336, MCA, while the partial pit backfill alternative clearly violates the Statement of Intent of the MMRA. Also, when considering all relevant technical factors, there actually is no significant difference in post-mine environmental benefit between an open pit or a partially backfilled pit. With regard to water quality, essentially the same rate of pumping is required for either the pit pond (Proposed Action) or the backfilled pit. Under the no pit pond scenario, a partial pit backfill scenario would reduce the potential site-wide treatment needs by between approximately 11 to 14 percent. A pit dewatering system and a water treatment plant are still required for all reclamation scenarios.

As stated before, GSM believes the Draft EIS provides sound technical evaluations of the Proposed Action and alternatives. We appreciate the opportunity to provide this additional information for use in the Final EIS and for consideration in the agencies' Record of Decision.

Sincerely,

Raymond Lazuk
Environmental Director

Response to Letter 23

Letter 24

GOLDEN SUNLIGHT MINES, INC.

RECI
JAN 0 5

January 5, 1998

Mr. Greg Hallsten
Montana Department of Environmental Quality
P.O. Box 200901
Helena, MT 59620-0901

Mr. Dave Williams
Bureau of Land Management
P.O. Box 3388
Butte, MT 59702

Subject: Comment on Golden Sunlight Mine Draft EIS.

Dear Mr. Hallsten and Mr. Williams:

Thank you for the opportunity to present this testimony at the public hearing to be held in Whitehall January 5, 1998.

General

24-1 The Draft Environmental Impact Statement is rigorous and thorough in its analyses of potential environmental impacts from Golden Sunlight's Proposed Action and alternatives. The technical work is backed up by data collection and real time analyses spanning more than 15 years of operations. Years of testing water quality models, reclamation cap designs, slope angles, and measured results have now validated the July 1990 authorization of Amendment 008 and stipulations based on the original EA analysis.

Timeliness

24-2 After the court settlement setting this EIS in motion, GSM, the agencies, and the plaintiffs reasonably forecast that the EIS would be complete in a time frame less than half that which has already transpired. The forecasts were reasonable given the work already done on the EA and the fact that the permit was for an expansion of an existing operation.

Two years to complete GSM's Draft EIS is excessive. Delays have had a direct impact on GSM operating costs and have made necessary a continuing re-engineering and re-scheduling of the mining sequence in order to stay within permit boundaries for overburden placement. Uncertainties rising out of delays have had a direct impact on Golden Sunlight's 1998 Capital Budget. These are serious negative impacts.

Response to Letter 24

24-1 Comment noted.

24-2 Comment noted. See also the Response to Comment 29-1.

Letter 24 Continued

Golden Sunlight Draft EIS Comments
January [illegible]
Page 2 of 3

Delays were, in part, caused by "analysis paralysis." The cost to government and those who pay the bill is also a negative impact.

24-2 A structure for tighter time frames within which all parties interested in the permitting process have the opportunity to participate needs to be devised.

Delays have a one-sided negative impact on project proponents. Without improvements in time management the agencies are giving a huge advantage to opponents of any permit. I don't believe either NEPA or MEPA intended this.

Pit Reclamation Feasibility

The Draft EIS Summary is incomplete in its discussion of the agency preferred alternative where the criteria for dismissing the Partial Pit Backfilling Alternative is given. GSM's Proposed Action complies with all Metal Mine Reclamation Act requirements. The Partial Pit Backfill Alternative fails to meet the intent of the MMRA. The discussion should elaborate on all the criteria in addition to the cited economic feasibility criteria.

The discussion should make clear the fact that partial backfilling forecloses future access to defined yet-to-be-proven mineral resources – in addition to the foreclosure on production of 400 thousand ounces of proven minable reserves in the Proposed Action.

The Summary should discuss why there is minimal, if any, environmental benefit to the Partial Pit Backfill Alternative. For instance, backfilling does not eliminate the need for long-term water management and offers no benefit to wildlife habitat. In fact, under GSM's proposed reclamation plan, the open pit will be reclaimed to create new bat and raptor habitat to augment over 4,300 acres of off-site land preserved by GSM as open space and habitat for birds and large and small mammals. 24-3

The following points are to illustrate why the MMRA language on 'future access' is so important.

- Valuable non-renewable mineral deposits are uncommon. They occur where nature put them.
- Mineral occurrence is only the first step in the definition of a mine. Only that mineral which can be harvested profitably will get mined.
- Mineral deposits frequently remain after a specific mining operation has finished mining. A higher commodity price or a cost-reducing technological innovation or exploration discovery could extend the amount of valuable mineral harvested in the future. The best place to look for minerals is where they've already been mined. Renewed mining activity in old districts is a common occurrence. And today, it is usually at a huge benefit to the environment because of the improved reclamation and regulatory standards.

Response to Letter 24

24-3 Please see the Response to Comment 23-5.

Letter 24 Continued

Golden Sunlight Draft EIS Comments
January 5, 1998
Page 3 of 3

- If a mineral deposit is continuing at depth and there is a possibility for future mining then the MMRA wisely discourages reclamation requirements "that may foreclose future access to mineral resources not fully developed by current mining operations".

24-3 It will only be in rare situations where pit backfilling will satisfy all the requirements of the Metal Mine Reclamation Act. This is as it should be given the facts stated above.

Feasibility as defined in the Act is easy to conceptualize. It is easy to look at the geometry of a deposit and conclude whether or not access to mineral is being denied by backfilling.

24-4 DEQ required financial data to determine why pit backfilling was not "economically feasible." Proprietary financial information is protected by Montana's Constitution. Detailed cash flows and the cost of capital are the only information considered proprietary. DEQ should make very clear to the public that all technical and operational and non-proprietary financial information submitted to DEQ is available for review.

Sincerely,

Jerry Harrington
Jerry Harrington
Mine Manager

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Response to Letter 24

24-4 Comment noted.

Letter 25

AFFCO

Anaconda Foundry Fabrication Company, Inc.
dba AFFCO
[illegible]
Anaconda, MT [illegible]
Telephone [illegible]
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December 17, 1997

RECEIVED
DEC 1 8 '97
MT DEPT OF ENV QUALITY
PERMITTING & COMPLIANCE DIV

Mr. Greg Hallsten
Dept. of Environmental Quality
Impact Assessment Bureau,
P.O. Box 200901
Helena, MT 59620

Dear Mr. Hallsten:

Re: Golden Sunlight Mine - Draft Environmental Impact Statement

Thank you for the summary of the Draft Environmental Impact Statement. After thorough review and analysis of the technical elements and general content of the draft, the document is undoubtedly a thorough and conclusive document relative to the alternatives and environmental effects on the mining operations and proposed expansion of operations at Golden Sunlight Mines.

The water management plan and mixing zone analysis, submitted by the company, provide comprehensive immunity relative to the protection of on-site and down stream water resources. The company's commitment in providing several thousand acres in wildlife habitat is not only unprecedented in industry, but voluntary. Golden Sunlight's intentional obligation as a leader in environmental stewardship, whether it be in their reclamation activities, protection and augmentation of wildlife habitat, through to their unparalleled guardianship of water resources, is truly exemplary.

25-1 The primary platform of the opposition is the component of the plan relative to pit backfilling. As clearly evidenced in the plan, this procedure would make no improvement to wild life habitat, air quality or water protection. The single reason for exploiting this issue is its consequence on the prematurely closure of the operation.

Golden Sunlight Mines, Inc. is not only a forerunner in environmental protection, but as well, an important major to Montana's economy. The operations financial support to local school districts and surrounding communities is substantial and much too important to jeopardize. While we respect

page 2 . . .

Response to Letter 25

25-1 Comment noted. Please see the Response to Comment 23-5.

Letter 25 Continued

Mr. Greg Hallsten
Dept. of Environmental Quality
page 2 - contd

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and value the rights of opposition to the EIS, we strongly discourage the department's entertainment of any frivolous dissension.

To enable Golden Sunlight Mines, Inc to continue with its mining operations and planned expansion, I would urge you to expedite the EIS process and issue the Record Of Decision as quickly as possible. The Draft EIS should be incorporated into the Final EIS verbatim.

Yours very truly,

Robert S. Mackey

Robert S. Mackey
Vice-President and
Manager of Operations

c Mr. Dave Williams
BLM - Butte District
Headwaters Resource Area
P.O. Box 3388
Butte, MT 59702

Response to Letter 25

Letter 26

[illegible]

December 17, 1997

RECEIVED
DEC 18 '97
MT DEPT OF ENV QUALITY
[illegible]

Mr. Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
P.O. Box 200901
Helena, MT 59620

Dear Mr. Hallsten:

Re: Draft Environmental Impact Statement - Golden Sunlight Mines, Inc.

I have received and reviewed the full text of the *Draft Environmental Impact Statement* relative to the proposed operational expansion at Golden Sunlight Mines, Inc. The document is very through and a true testimonial to sound technical analysis of the environmental effects and alternatives for this proposed expansion.

The concepts within the detailed water management plan submitted by Golden Sunlight are comprehensive and adequately provides for sufficient safeguards to protect water resources. The mixing zone evaluation satisfactorily guards and preserves down stream water.

26-1 Of particular interest was measure WT-4, which characterizes the avoidance of areas from May through July to protect bird nesting habitat. This measure is extreme and unreasonable. A mining operation cannot realistically or financially suspend operations for any specified period of time. The acreage of *potential* bird nesting habitat at the mine is infinitesimal in relation to that which is consumed by cities, towns, road, etc., but nonetheless Golden Sunlight in the spirit of constant environmental stewardship provides several thousand acres of wildlife habitat, both at the mine and in the Whitehall vicinity.

Historically, Golden Sunlight Mines, Inc. has been an incomparable leader in environmental protection. Measures, external of its obligations, are the norm at this operation. This enterprising operation pioneered steep slope reclamation. The success of this measure can be easily viewed, from afar, in the native vegetation growing in the re-vegetated areas, particularly to the west of the current pit area.

26-2 Generally, opposition to the EIS will come from those that demand pit backfilling. As proven, even if this measure was economically feasible, it provides absolutely no environmental benefit. Again,

page 2

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Response to Letter 26

26-1 Comment noted. Please see the Response to Comment 23-2.

26-2 Comment noted. Please see the Response to Comment 23-5.

Letter 26 Continued

Mr. Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
page 2 - cont...

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this argument, despite it being economical, is merely a whimsical straw, for the opposition's ultimate objective which is mine closure. However, and despite the callous tactics and words, Golden Sunlight continues in a most admirable aura of compromise. The EIS is convincing evidence of this charitable compromise.

Golden Sunlight Mines is a significant contributor, not only to its community, but to the economy of the entire state. Delays in the operations EIS approval would seriously jeopardize the livelihoods of many people, both in the operation and for its suppliers contractors and school districts.

On a final note, while employed in Anaconda, I live near Whitehall, on the north side of the Interstate, essentially in the shadow of Golden Sunlight's western waste dump sites. I reside there, drink water from my well, breath the fresh Montana air, watch the wildlife scampering out my window, and never without a single worry that this operation will ever interrupt, impede or endanger any of these simple pleasures.

I strongly urge you to expedite the EIS process and issue the Record of Decision on behalf of Golden Sunlight Mines.

Yours very truly,

Ronald A. Tuchimas
Manager of Accounting
and Administration

c: Mr. Dave Williams
Bureau of Land Management - Butte District
Headwaters Resource Area
P.O. Box 3388
Butte, MT 59702

Response to Letter 26

Letter 27

ARCO
ARCO Environmental
Remediation L.L.C.
[illegible]

RECEIVED
DEC 05 1997
D.E.Q.

December 2, 1997

Department of Environmental Quality
Impact Assessment Bureau
Attn: Mr. Greg Hallsten
P.O. Box 200901
Helena, Montana 59620

Dear Mr. Hallsten:

Please accept this letter as written support of Golden Sunlight Mine's Operating Permit No. 00065.

The Draft EIS thoroughly analyzes the alternatives and environmental effects of mine expansion.

In addition to operating in a responsible manner, Golden Sunlight has used innovative reclamation techniques, minimizing erosion and water infiltration, improving animal habitat, and increasing recreational opportunities.

Past management practices of the Golden Sunlight Mine clearly demonstrate a commitment to environmental protection. Based on this past performance, please expedite the Final EIS and issue the ROD as quickly as possible.

Yours truly,

Sandra M. Stash, P.E.
Vice President - Environmental Services

Response to Letter 27

Thank you for your letter. No response necessary.

Letter 28

ASARCO

East Helena Plant
John R. Shaw
Plant Manager

January 6, 1998

RECEIVED
JAN 12 1998
[illegible]

Mr. Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
P.O. Box 200901
Helena, MT 59620

Dear Mr. Hallsten:

The staff and management of the Asarco East Helena plant supports Golden Sunlight Mine's application for a 404 permit allowing the continued and expanded operation of their Whitehall, MT mine.

Golden Sunlight Mine has consistently demonstrated its strong commitment to protecting the environment and operating the facility at the highest industry standards. The good corporate citizenship practiced by Golden Sunlight Mine was best described in the testimony given by local citizens at the EIS public hearing held on 01/05/98. This type of community support can only be achieved through responsible stewardship of resources, land and habitat. The actions Golden Sunlight has taken to ensure future habitat and environmental quality are to be applauded.

The Golden Sunlight Mine is an asset to both the Community it shares and the state of Montana. Allowing access to the mine's reserves will ensure this asset is realized for the people within the Community and the State.

We respectfully urge the Department of Environmental Quality to approve Golden Sunlight Mine's application for an expanded operating permit.

John R. Shaw
Plant Manager

cc: Dave Young
Doug Parker

ASARCO Incorporated, P.O. Box 1230, East Helena, MT 59635
(406) 227-7120
Fax No. (406) 227-8807

Response to Letter 28

Thank you for your letter. No response necessary.

Letter 29

ASARCO

Troy Unit
D.K. Young
Manager

RECEIVED
DEC 31 1997
MT. DEPT OF ENV QUALITY
PERMITTING & COMPLIANCE DIV.

December 30, 1997

Mr. Greg Hallsten
Montana DEQ
Impact Assessment Bureau
PO Box 200901
Helena, MT 59620

Mr. Dave Williams
BLM- Butte District
Headwaters Resource Area
P O Box 3388
Butte, MT 59702

RE: Golden Sunlight Mine Operating Permit No 00065
Comments on Draft EIS

Dear Sirs,

I would like to take this opportunity to comment on the recent Draft EIS for the proposed expansion of the Golden Sunlight Operations near Whitehall, MT.

General Comments

29-1 The scheduling and completion of the EIS has not been in a timely manner, especially for an expansion of an existing operation. The baseline data and real time analysis of actual impacts (the operating mine) have been available to all concerned agencies for many years. Why has this document preparation taken so long? The timeframes for preparation of the required NEPA and MEPA documents should be reasonable.

It is my understanding that the continued operation of the mine in a financially feasible manner has been jeopardized, due to the delay in the document. Since Golden Sunlight made application for expansion of the project at a reasonable date, are the agencies responsible for the completion of the document, also responsible for the financial loss?

ASARCO Incorporated Box 848 Troy Montana 59935 (406) 295-5882 FAX (406) 295-6111

Response to Letter 29

29-1 Scheduling the preparation of an EIS is difficult, and schedules often change as circumstances and analysis change. The agencies have proceeded as expeditiously as possible to produce a legally adequate and defensible EIS. Although the agencies have not conducted extensive legal research on this matter, they are not aware of any case law indicating that under these circumstances an agency is responsible for financial losses that an applicant might incur during the permitting process.

Letter 29 Continued

Golden Sunlight
Draft EIS Comments
page 2

Specific Comments

29-2
- The Water Management plan has been thoroughly detailed and reviewed, with sufficient contingencies to protect water resources.

29-3
- The COE 404 permit demonstrates that the operation will comply with all sections of the wetland law requirements.

29-4
- We have strong reservations about mitigation by " avoidance " for bird nesting habitat. The surrounding habitat that has been used as mitigation should be more than enough for the disturbed acreage.

29-5
- As is common with most EIS documents the real value to local communities and regional service centers has been ignored. Man is as much a part of the environment as any other species. How can direct jobs for more than 200 people, an annual payroll of $ 10 million along with spending over $ 21 million annually in goods and services not be counted as a positive impact to the area and the environment. These are not projected values for some project in the future. These are real jobs, with real money, for real people - now. What other type of projects, with know mitigated impacts, will produce over $ 1.8 million in tax base annually?

The mining industry has changed dramatically over the past few years, due to more stringent laws concerning the environment - we had to. We will continue to be in the forefront in developing better ways to do the job of providing vital metals and minerals to the American economy. Through cooperative team building programs, working with the local community, state and federal agencies, local environmental groups and other industries, the American mining industry will better serve the people and the environment.

If you have any questions or comments please feel free to contact me at the Troy Unit office (406) 295-5882.

Sincerely,

David K. Young
Unit Manager

cc: Jerry Harrington (Golden Sunlight Mine)
Jill Andrews (Montana Mining Association)

Response to Letter 29

29-2 Comment noted.

29-3 Comment noted.

29-4 Comment noted. Please see the Response to Comment 23-2.

29-5 The socioeconomic impacts of the proposed project are described in section IV.J; the agencies have considered all impacts described in the EIS in consideration of a preferred alternative.

Letter 30

Barretts Minerals Inc.
P.O. Box 1147
Dillon, MT 59725
Tel [illegible]
Fax [illegible]

December 12, 1997

RECEIVED
DEC 17 1997
[illegible]

Mr. Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
P.O. Box 200901
Helena, Montana 59620

Dear Mr. Hallsten:

We are in support of the Golden Sunlight Mine (O.P. #00065) expansion. The draft EIS appears to adequately identify the environmental effects of the proposed activities and provides a high degree of technical analyses of the various alternatives.

We feel that if the water management plan and mixing zone analysis prepared by Golden Sunlight are followed, the water resources and down stream beneficial uses will be adequately protected.

Golden Sunlight has been a responsible business member to the communities served. They are essential supporters of many causes and organizations that enhance our citizens quality of life. They continue to be a responsible steward of the environment. They have been instrumental in many project to preserve open spaces and improve wildlife habitat.

Golden Sunlight is an important contributor to the economy of Southwest Montana. For many years now they have provided stable high paying jobs to a local work force in a economically depressed area. Excessive delays in the permitting process have hurt the mining industry in general and specifically the hard working miners that are the lifeblood of our small rural communities. We feel this is a sound project and should be approved without further delay.

Thank you for your consideration.

Sincerely,

John C. Parks

John C. Parks
EH&S Manager
Barretts Minerals Inc.

c: MMA

"THIS PAPER CONTAINS SPECIALTY MINERALS INC.'S PCC"

155

Response to Letter 30

Thank you for your letter. No response necessary.

Letter 31

RECEIVED
JAN 3 0 1996
[illegible]

January 25, 1996

Mr. Greg Hallsten
DEQ
P.O. Box 200901
Helena, MT. 59620-0901

Dear Mr. Hallsten,

I write to commend you on your department's thorough environmental impact statement on the proposed continuation of mining at Golden Sunlight—and to support the mine's proposal.

I operate a business in Whitehall, and the fact is that the health and survival of my business - my own livelihood and that of my employees depends on the permitting decision you are finally about to make. We have endured years of uncertainty in this community, and we are anxious for Golden Sunlight to receive the approval it clearly deserves.

I know the mine's employees. They are my neighbors, and I am well aware of the fact that they are operating a modern mine of the highest environmental quality. This community needs these good-paying jobs, and the mine deserves a prompt and favorable permitting decision.

Thank-you for the opportunity to participate in this public decision making process.

Sincerely,

D.M. Hendy
David M. Hendy

Big Iron Equipment & Repair
518 N. Whitehall St.
Whitehall, MT. 59759
287-3082

Response to Letter 31

Thank you for your letter. No response necessary.

Letter 32

Boart Longyear Company
[illegible] West 1700 South
Salt Lake City, Utah [illegible] USA
P.O. Box [illegible]
Salt Lake City, Utah [illegible] USA
Telephone: [illegible]
Fax: [illegible]

BOART LONGYEAR

December 8, 1997

RECEIVED
DEC 11 1997
MT. DEPT OF ENV QUALITY
PERMITTING & COMPLIANCE DIV.

Mr. Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
P. O. Box 200901
Helena, MT 59620

Dear Mr. Hallsten:

I am writing you in support of Golden Sunlight Mine's Operating Permit No. 00065, which would allow continued and expanded operation of their mine in Whitehall, Montana.

The draft EIS appears to have been well prepared and provides a high level of technical analyses of the alternatives and environmental effects of this proposal.

I believe that the Water Management Plan and Mixing Zone analysis have addressed ways to ensure that Water Quality Standards are adhered to and protected.

I support Golden Sunlight's application for a 404 permit from the Corps of Engineers, and believe the company has demonstrated a willingness to comply with all 404 requirements.

I would also urge you to expedite this EIS process as quickly as possible. The continued profitable operation of the mine depends upon receiving approval to expand. More than 200 jobs and substantial amounts of income to suppliers of goods and services are at stake.

Boart Longyear has seen its employment of Montanans steadily drop over the past five years. We have just purchased (September 1997) a Montana corporation to expand our business in underground core drilling, but we are seriously considering moving it out of Montana and into a location more friendly to the mining business. This decision will be hastened by a reduction of available work in Montana.

Response to Letter 32

Thank you for your letter. No response necessary.

Letter 32 Continued

Letter to Mr. Greg Hallsten
December 8, 1997
Page Two

Golden Sunlight has operated in a responsible manner and utilized its resources to develop public access, establish training facilities and provide animal habitat. I believe that philosophy of good corporate citizenship will continue and make Golden Sunlight one of the leading examples of mining in our state. Please expedite the final EIS and issue an ROD as quickly as possible.

Sincerely,

Michael Jagow
Vice President - Contracting Services

MJ:nba

Response to Letter 32

Letter 33

Cardwell Store & RV Park
770 Hwy 2 East
P.O. Box 10
Cardwell ,MT 59721
PH# 406/287/5092 work
Fax # 406/287/5092
PH# 406/287/5028 home

RECEIVED
JAN 14 1998
MT. DEPT OF ENV QUALITY
PERMITTING & COMPLIANCE DIV.

Dear Mr. Hallsten and / or Mr. Williams

I am writing in support of the Golden Sunlight mine's proposed action plan in the environmental impact study recently released by your department.

I feel that the Golden Sunlight mine has done their part in following the EIS requirements to a -T- to protect water resources, slope reclamation, pit reclamation & wildlife habitat around the mine site.

As a businessmen and a adjacent land owner. The Golden Sunlight has done a excellent job in its commitment to environmental protection. The Golden Sunlight has also played a big part in the community and surrounding areas, purchasing millions in goods and services annually. For example, the Golden Sunlights last layoff cost my business a loss of 5 good customers, which was very noticeable to the pocket book. And I am sure it was the same for a lot of other businesses as well. Montana needs good businesses like the Golden Sunlight to help play a big part in Montana's economy, along with agriculture and logging. With out mining many business, jobs, and revenue would sees to exist in Montana due to the slow economy during the winter months. So lets use a little common sense and keep Montana's people working. Instead of letting these so called environmentalist cause hardship on the people that live, work, SUPPORT, and pay taxes in this State of Montana.

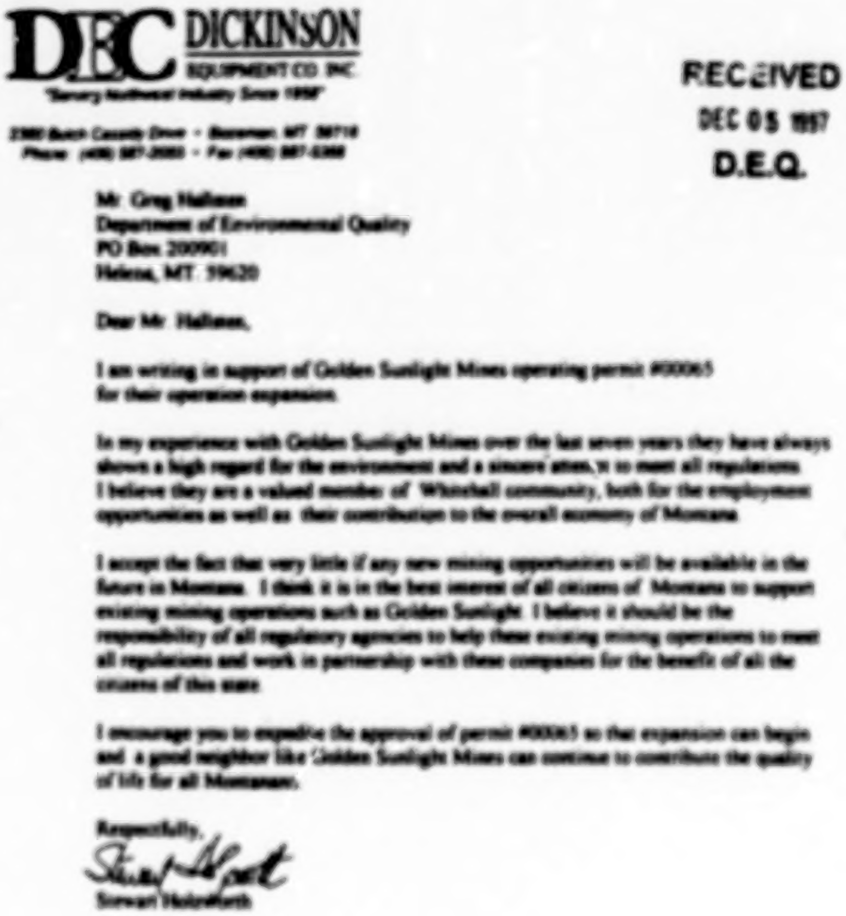
Sincerely

Kipp E [illegible]
Kipp E
Managing/Member
Owner

Response to Letter 33

Thank you for your letter. No response necessary.

Letter 34



DEC DICKINSON
EQUIPMENT CO. INC.
[illegible]

[illegible]
[illegible]

RECEIVED
DEC 05 1997
D.E.Q.

Mr. Greg Hallsten
Department of Environmental Quality
PO Box 200901
Helena, MT 59620

Dear Mr. Hallsten,

I am writing in support of Golden Sunlight Mines operating permit #00065 for their operation expansion.

In my experience with Golden Sunlight Mines over the last seven years they have always shown a high regard for the environment and a sincere attempt to meet all regulations. I believe they are a valued member of Whitehall community, both for the employment opportunities as well as their contribution to the overall economy of Montana.

I accept the fact that very little if any new mining opportunities will be available in the future in Montana. I think it is in the best interest of all citizens of Montana to support existing mining operations such as Golden Sunlight. I believe it should be the responsibility of all regulatory agencies to help these existing mining operations to meet all regulations and work in partnership with these companies for the benefit of all the citizens of this state.

I encourage you to expedite the approval of permit #00065 so that expansion can begin and a good neighbor like Golden Sunlight Mines can continue to contribute the quality of life for all Montanans.

Respectfully,

Stewart Holdsworth

Response to Letter 34

Thank you for your letter. No response necessary.

Letter 35

[illegible] Intermountain, Inc.
[illegible]
[illegible]
[illegible]
[illegible]

December 10, 1997

RECEIVED
DEC 12 1997
MT DEPT OF ENV QUALITY
PERMITTING & COMPLIANCE DIV.

Mr. Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
P.O. Box 200901
Helena, Montana 59620

Dear Mr. Hallsten,

We are writing you in support of Golden Sunlight Mine's Operating Permit No. 00065, which would allow continued and expanded operation of their mine in Whitehall, MT.

It seems the draft EIS has been well prepared and provides a high level of technical analysis of the alternatives and environmental effects of this proposal. It is believed the Water Management Plan and Mixing Zone analysis have addressed ways to ensure that Water Quality Standards are adhered to and protected.

We support Golden Sunlight's application for a 404 permit from the Corps of Engineers and believe the company has demonstrated a willingness to comply with all 404 requirements.

We urge you to expedite this EIS process as quickly as possible. The continued profitable operation of the mine depends upon approval to expand. More than 200 jobs and substantial amounts of income to suppliers of goods and services are at stake.

Thank you for your consideration of our support of Golden Sunlight Mine's Operating Permit No. 00065.

Sincerely,

Joseph W. Hejny

Joseph W. Hejny
President/General Manager

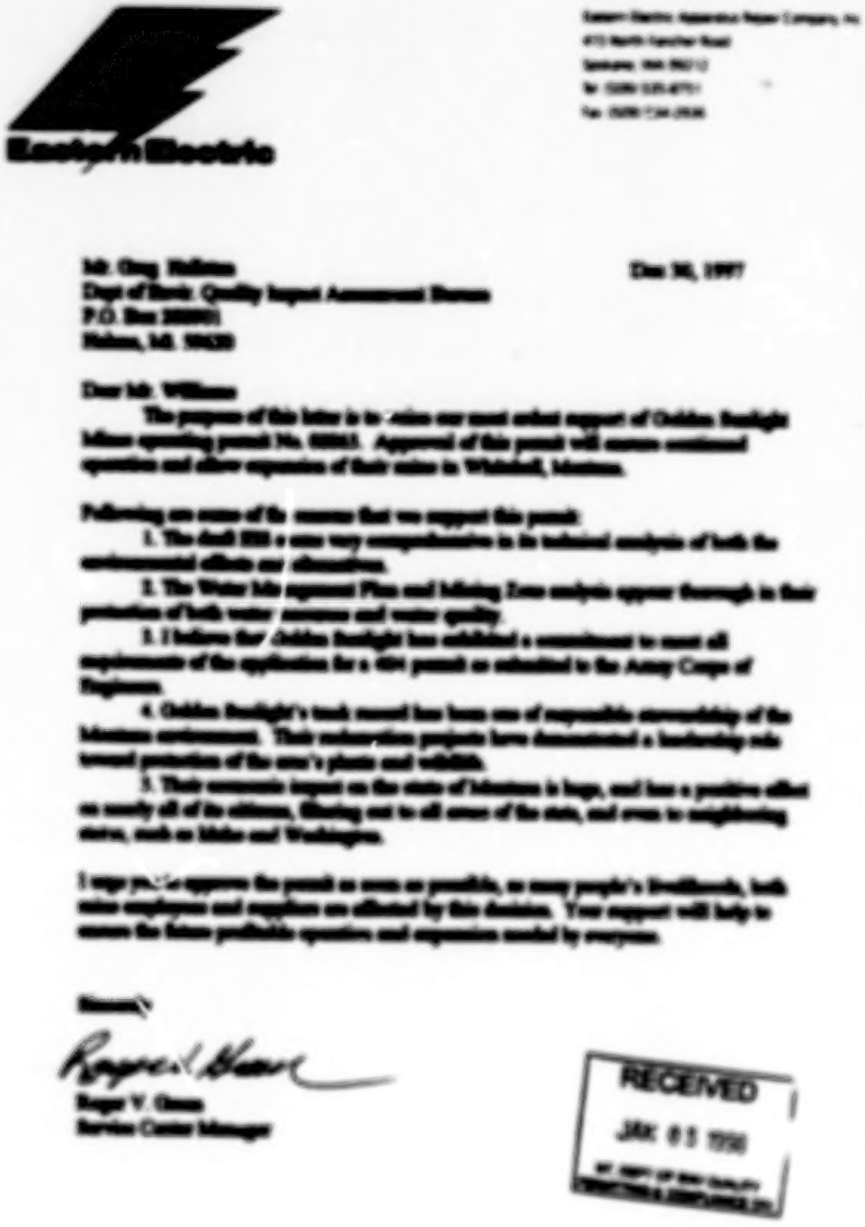
[illegible]

161

Response to Letter 35

Thank you for your letter. No response necessary.

Letter 36



RECEIVED

Response to Letter 36

Thank you for your letter. No response necessary.

BEST COPY AVAILABLE

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PAGE

Letter 37

ENERGY

ENERGY LABORATORIES, INC.
[illegible]
[illegible]

RECEIVED
[illegible]
MT. DEPT OF ENV QUALITY
PERMITTING & COMPLIANCE DIV

December 8, 1997

Mr. Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
PO Box 200901
Helena, MT 59620

Dear Mr. Hallsten:

I am writing to express my support of Golden Sunlight Mine's expansion permit.

The mine has operated in an environmentally responsible manner. They have demonstrated by management practices, habitat protection, and reclamation that they are committed to protecting the environment. My company has worked closely with the environmental staff at the mine for many years. We have seen their attention to detail and the thoroughness of their monitoring programs from a unique perspective. They take their duties to the environment very seriously.

The mine is a very important economic contributor in our state. They provide good jobs directly and indirectly associated with the mine and pay substantial taxes. They have demonstrated that they are a good neighbor and excellent employer.

I urge you to complete the EIS process quickly so that the mine can continue to operate in a profitable manner.

Sincerely,

Energy Laboratories, Inc.

John Standish
Vice President

Response to Letter 37

Thank you for your letter. No response necessary.

Letter 38

Fickler Oil Company, Inc.

[illegible]
[illegible]
[illegible]
Fax [illegible]

RECEIVED
DEC 09 1997
D.E.Q.

December 5, 1997

Mr. Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
P.O. Box 200901
Helena, Montana 59620

Dear Mr. Hallsten:

I am writing to you to express my support of Golden Sunlight Mine's operating permit No 00065, which is needed for expanded operation of their mine in Whitehall, Montana. Profitable operation of the mine depends upon receiving approval to expand its operations and continue the employment of over 200 people.

Golden Sunlight, in the past, has demonstrated good corporate citizenship by providing several thousand acres of wildlife habitat. The company has demonstrated a strong commitment to protect the environment. This is shown by the way it responds to environmental concerns.

The draft EIS is thorough and provides a satisfactory level of technical analysis of the alternatives concerning the environment. Water quality standards can be protected and adhered to by the proposed water management plan put forth by Golden Sunlight.

I also support Golden Sunlight's application for a 404 permit from the Corps of Engineers.

Golden Sunlight's economic contributions to the State of Montana, local school districts, and surrounding communities is substantial. I urge you to approve the final EIS and issue the ROD as soon as possible.

Sincerely,

Lawrence E. Fickler, President
Fickler Oil Company, Inc.

Response to Letter 38

Thank you for your letter. No response necessary.

Letter 39

JOHN W. GABELMAN & ASSOCIATES, INC.
33 PORTLAND COURT, DANVILLE, CA 94526 [illegible]

GEOLOGY
REMOTE SENSING
MINERAL ENGINEERING/EVALUATION

MINERALOGY/PETROGRAPHY
GEOCHEMISTRY
MINERAL GEOPHYSICS

12 January 1998

RECEIVED
JAN 21 1998
MT DEPT OF ENV QUALITY
PERMITTING & COMPLIANCE DIV.

Mr. Greg Hallsten
MDEQ
P.O. Box 200901
Helena, MT 59620-0901

Mr. Dave Williams
BLM - Butte District
Headquarters Resource Area
P.O. Box 3388
Butte, MT 59702

Dear Mr. Hallsten and Mr. Williams:

I am writing to lend our support to the Golden Sunlight Mine Expansion Program and to urge early acceptance of the Environmental Impact Statement in its present form. We believe that Golden Sunlight's operation at Whitehall has long since proven to be unusually efficient and responsible to the community it effects and to the environment as well as to its parent company, Placer Dome. We believe that it has and can continue to benefit greatly the people and economies of the local community, the county, the state, and less directly the nation and national mining industry.

I have taken the liberty of evaluating the alternatives and stipulations of the Summary of the Draft EIS, covering mine expansion, guided by my 56 years experience in mining and geology. I believe that it addresses thoroughly and realistically the issues that appear of greatest concern to the environmental aspects of the operation: oxidative acid generation, preservation of water quality, ground stabilization and reclamation. In fact it has so thoroughly considered the worst-case scenarios of even the most unexpected events, that its analyses seem to approach the point of diminishing returns. I think the author agencies have been economically realistic and fair in their selection, although I can't escape the personal conclusion that some of the stipulations and issues approach being token obstacles to natural change, little needed concessions to environmental enthusiasm that tend to intrude on the operating cost margin already narrowed by the low price of gold. (I long ago learned the fundamental axiom of nature: nothing is changless but change itself. I believe that many attempts to preserve or restore a landscape are being carried beyond what geological change will allow. I have seen many yearly natural changes in landscape configuration, and particularly in stream channels.)

It is apparent that timely approval of a mine plan has become critical operationally and economically. It would seem from the summary and Golden Sunlight's comments that an acceptable alternative has been identified, and that the stipulations have been long accommodated. Most of the issues raised subsequently all seem to be relatively minor operational details (e.g. closing historical adits to benefit bats) alongside the fundamental question of having or not having an operation. (I'm familiar with closing old adits to protect adventurous children, but keeping them open for bats is new to me.) Such details could be worked out after an operation is assured.

Response to Letter 39

Thank you for your letter. No response necessary.

Letter 39 Continued

Mrs. Gabelman, with a long record of activity in the Women's Auxiliary of the Institute of Mining Engineers, and community organizations, is more interested in the benefits a mining operation can provide to people and economy from local to national levels. The WAIME is noted worldwide for scholarships to promising students. Mrs. Gabelman has crusaded for several Montana mines, emphasizing the jobs that the mines make available, and the strong social and economic support they give to all aspects of community life and to government. She constantly points out that every item essential or useful to our lives today are of materials that must be grown or mined, and that opposing or hindering mining promotes the decline of living standards so arduously built up by technology and American ingenuity and enterprise. Of all the commodities, gold always has been the most fundamentally critical to the money systems and economies of the world, as well demonstrated throughout history. Rather than depend primarily on tourism (which basically makes local communities public servants) to nourish and expand Montana's economy, why not use Montana's gold to maintain the pride and dignity of independent industrialism. Gold is a commodity the world needs and wants.

It is evident from the draft EIS that great and detailed attention has been accorded to every possible practical and economic way to expand the operation and still exert maximum beneficial custodianship of the environment. Little more can be expected, except the support of the several governmental agencies with the privilege of decision, and the support of the Montanan and national public, who stand to benefit also from the expansion. As the MDEQ and BLM seem to have already agreed on a combination of alternatives (the Proposed Action plus the Return Diversion) that appears acceptable to the Company we urge its approval as quickly as possible.

Sincerely yours,

John W. Gabelman

Olive T. Gabelman

Response to Letter 39

Letter 40

GOLDEN SUNLIGHT MINES, INC.

1 December, 1997

Mr. Greg Hallsten
MDEQ
P.O. Box 200901
Helena, MT 59620-0901

Dear Greg:

I am submitting my comments in support of Golden Sunlight's Draft EIS. I believe that this document is sound and that the data has been openly prepared with outstanding technical expertise. GSM should be granted the permit to continue mining.

The analytical data clearly indicate that mining can continue in a manner that will protect all of Montana's environmental resources. The water management plan details how the groundwater will be protected. The use of mixing zones is an excellent technique. Dry gulches will be more than compensated for through water management and reclamation and preservation.

40-1 Backfilling of the pit should not be required in the final EIS decision, as this would cover a valuable resource. The base of the breccia pipe has never been reached and some of the highest gold grades were encountered in beneath the ultimate pit bottom. Backfilling would make this potential resource unavailable for open pit mining, the weight of the material would force the required crown pillar to be much too large, and improving technology will certainly lower the mineable grades in the future. Filling the pit does not eliminate environmental problems – in fact being able to actually see what is happening to groundwater in the pit would make it easier to control any problems. In addition, mining should be permitted to operate under reasonable and feasible conditions.

Delays in this EIS would threaten GSM's mining operation. I compel the DEQ and BLM to do all they can to issue the ROD as soon as possible.

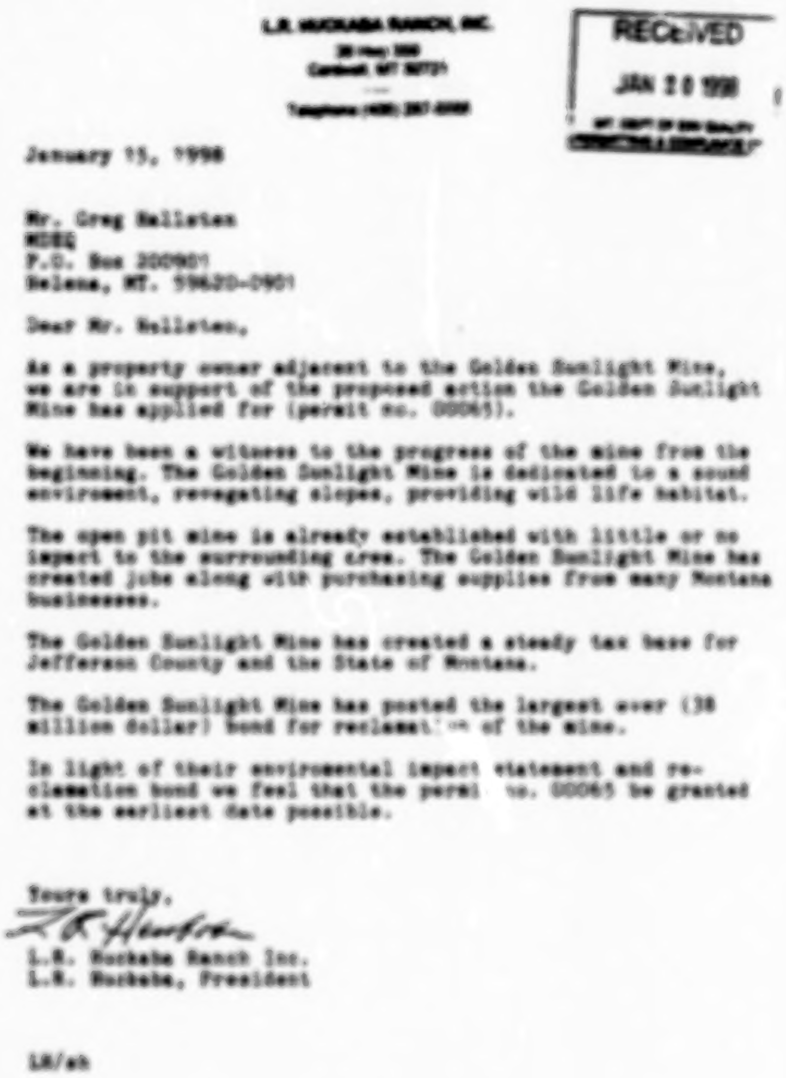
Sincerely,

Jean [illegible]
Senior Geologist

Response to Letter 40

40-1 Comment noted. Please see the Responses to Comments 16-37 and 23-5.

Letter 41



L.R. HUCKABA RANCH, INC.
[illegible]
Cardwell, MT 59721
Telephone (406) 287-[illegible]

RECEIVED
JAN 20 1998
MT. DEPT OF ENV QUALITY
PERMITTING & COMPLIANCE

January 15, 1998

Mr. Greg Hallsten
MDEQ
P.O. Box 200901
Helena, MT. 59620-0901

Dear Mr. Hallsten,

As a property owner adjecent to the Golden Sunlight Mine, we are in support of the proposed action the Golden Sunlight Mine has applied for (permit no. 00065).

We have been a witness to the progress of the mine from the beginning. The Golden Sunlight Mine is dedicated to a sound enviroment, revegating slopes, providing wild life habitat.

The open pit mine is already established with little or no impact to the surrounding area. The Golden Sunlight Mine has created jobs along with purchasing supplies from many Montana businesses.

The Golden Sunlight Mine has created a steady tax base for Jefferson County and the State of Montana.

The Golden Sunlight Mine has posted the largest ever (38 million dollar) bond for reclamation of the mine.

In light of their enviromental impact statement and reclamation bond we feel that the permit no. 00065 be granted at the earliest date possible.

Yours truly,

L.R. Huckaba Ranch Inc.
L.R. Huckaba, President

LR/sh

Response to Letter 41

Thank you for your letter. No response necessary.

Letter 42

Koocanusa
Land Use Planning and Design, Inc

[illegible]

Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
PO Box 200901
Helena, MT
59620

January 15, 1998

Good Day

This letter is in response to the Environmental Impact Assessment prepared for the operations of the Golden Sunlight Mine near Whitehall. We shall soon be relocating to the White Sulphur Springs area and are taking an active interest in the activities of the surrounding area.

42-1 I support the agency preferred alternative, but am concerned about the possibility of partial back fill. Given the findings of the third party assessment that partial back filling is not economically feasible, I have to question the necessity of the back fill as outlined. Could the area to be reclaimed be reduced to a level appropriate to the economic reality, so as to permit the mine to continue its operations as planned?

The field we primarily work in is visual rehabilitation and mitigation of disturbed sites and I am impressed with the current reclamation efforts of the Golden Sunlight Mine to be as unobtrusive as possible from Interstate 90 and mimic the forms of the surrounding topography. Given their good record and location in forgiving terrain, I do not believe that extensive back filling for visually aesthetic reasons is justified. If back filling is intended as a way to contain mine wastes, will this hamper efforts for future ore extraction from the site?

I hope that this project goes through as planned as it will benefit many concerned Montanans.

Sincerely,

[illegible]
Koocanusa Land Use Planning and Design, Idaho
Koocanusa Land Use Planning and Design Inc., B.C.
E-Mail [illegible]

RECEIVED
JAN 21 1998
[illegible]

Response to Letter 42

42-1 Comment noted. Please see the Responses to Comments 16-37 and 23-5.

Letter 43

AN AFFILIATE OF LIBERTY PIPE CO.

December 10, 1997

Mr. Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
PO Box 200901
Helena, MT 59620

Mr. Dave Williams
BLM - Butte District
Headwaters Resource Area
PO Box [illegible]
Butte, MT 59702

RECEIVED
DEC 15 1997
MT. DEPT OF ENV. QUALITY
PERMITTING & COMPLIANCE DIV.

Dear Mr. Hallsten or Williams:

I am writing in support of Golden Sunlight Mine's Operating Permit No. 00065, which would allow continued and expanded operation of their mine in Whitehall, MT.

The draft EIS appears to have been well prepared and provides a high level of technical analysis of the alternatives and environmental effects of this proposal.

I believe that the Water Management Plan and Mixing Zone analysis have addressed ways to ensure that Water Quality Standards are adhered to and protected.

I support Golden Sunlight's application for a 404 permit from the Corps of Engineers and believe the company has demonstrated a willingness to comply with all 404 requirements.

I would also urge you to expedite the EIS process as quickly as possible. The continued profitable operation of the mine depends upon receiving approval to expand. More than 200 jobs and substantial amounts of income to suppliers of goods and services are at stake.

Golden Sunlight has operated in a responsible manner and utilized it's resources to develop public access, establish training facilities and provide animal habitat. I believe that philosophy of good corporate citizenship will continue and make Golden Sunlight one of the leading examples of mining in our state. Please expedite the Final EIS and issue ROD as quickly as possible.

Sincerely,

Sue DeVries

Sue DeVries
Sales Coordinator
Liberty Pipe Co.

Corporate Office: [illegible] Third Street North, Suite [illegible], Great Falls, MT [illegible], Ph [illegible], Fax [illegible]
Idaho Yard: [illegible] East Frontage Road North, Jerome, ID [illegible], Ph [illegible], Fax [illegible]

170

Response to Letter 43

Thank you for your letter. No response necessary.

Letter 44

McDonald
Gold Project

January 5, 1998

RECEIVED
JAN 06 1998

Mr. Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
PO Box 200901
Helena, MT 59620

Dear Mr. Hallsten:

The following are my comments on the Golden Sunlight Mine Draft EIS. I favor approval of the EIS and expanded operation of the mine

The EIS is well crafted and has addressed all concerns that have been brought forward. Golden Sunlight has always tried to be a good neighbor and has worked tirelessly to fill its responsibilities to residents of the Whitehall area and to protect the environment. This work has resulted in creation of 200 high paying jobs and provides a significant portion of the revenues in the Whitehall and Cardwell School Districts

44-1 I am pleased with effort that Golden Sunlight has taken to provide wildlife habitat near the mine that is ideal for bird nesting. The Mitigation Measure WF-4 which requires avoidance from May through July is an unacceptable alternative that could result in a suspension of operations.The reclamation work and creation of wildlife habitat that has been conducted to date will provide needed nesting ground.

I urge you to get the Final EIS approved as soon a possible and Record Of Decision issued.

Sincerely,

William M. Snoddy
Director of Public and Government Affairs

536 Main Street • P.O. Box 1117 • Lincoln, Montana 59639 • Tel (406) 362-4333 • Fax (406) 362-4991

Response to Letter 44

44-1 Comment noted. Please see the Response to Comment 23-2.

Letter 45

Midland Implement
Company Incorporated
Billings, Montana

December 15, 1997

RECEIVED
DEC 17 1997
MT DEPT OF ENV QUALITY
PERMITTING & COMPLIANCE DIV

Mr. Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
PO Box 200901
Helena, MT 59620

Dear Mr. Hallsten:

We are writing the DEQ on behalf of Golden Sunlight Mine's Operating Permit No. 00065, as we support a favorable endorsement, on their behalf.

We urge you to expedite this EIS process as quickly as possible. The continued profitable operation of the mine depends upon this approval. We understand fully the job impacts involved.

Golden Sunlight has complied fully to all requirements, so again, we urge your favorable action.

Sincerely,

Roger W. Webb

Roger W. Webb
Sales Manager

401 Daniel St. • P.O. Box 30558 • Billings, Montana 59107 • (406) 248-7771

MR

Response to Letter 45

Thank you for your letter. No response necessary.

Letter 46

MINEX
100 ARDEN / BELGRADE, MONTANA 59714 / USA
PHONE: (406) [illegible] / FAX: (406) [illegible]

8 January, 1998

RECEIVED
JAN 12 1998
[illegible]

Mr. Greg Hallsten
Dept. of Environmental Quality
Impact Assessment Bureau
P. O. Box 200901
Helena, MT 59620

Dear Mr. Hallsten:

I am writing to support Golden Sunlight Mine's extension of the operating permit and the draft EIS Proposed Action. It is important in Montana to have a multi-industry economy. Mining should be supported when it is done in an environmentally friendly manner. Golden Sunlight Mine has been a good neighbor since it began. Golden Sunlight people, not just management but every employee has done their best to make sure the mine operations protect the environment. Extending the life of the mine means more years of good jobs for Montanans also. We can hardly afford to lose these jobs prematurely. Our company depends on mines such as Golden Sunlight as customers.

I urge you to approve the final EIS.

Yours truly,

Pamela S. Backstrom

Pamela S. Backstrom

Response to Letter 46

Thank you for your letter. No response necessary.

Letter 47

[illegible]

RECEIVED
JAN 20 1998
MT DEPT OF ENV QUALITY
PERMITTING & COMPLIANCE DIV

January 15, 1998

Mr. Greg Hallsten
M.D.E.Q.
P.O. Box 200901
Helena, Montana 59620-0901

Dear Mr. Hallsten:

I am writing this letter in support of Golden Sunlight Mines Operating Permit No. 00065 and their Proposed Action Plan in the Environmental Impact Statement recently released by your department.

As in the case of most permit applications or amendments, one of the major issues is always water quality. The draft E.I.S. more than adequately addresses these issues. The Golden Sunlight Mine water management plan is well thought out and provides adequate contingencies to protect water resources in the mine area. Also, the Draft E.I.S. clearly shows that the Golden Sunlight Mine Proposed Action will be in compliance with all Section 404 requirements.

46-1 Another key issue is Golden Sunlight Mine's Proposed Action to not backfill the pit. Backfilling any open pit in a hardrock mine usually does not make sense. Pit backfilling in a stripping operation such as coal is a logical part of the mining sequence however in the case of hard rock mining the pit is usually active to the end of mine life. In Golden Sunlight Mine's case backfilling of the pit has little if any environmental benefit to air or water quality or the environment in general. Backfilling the pit would cause the mine to close prematurely eliminating access to some 400,000 ounces of reserves.

Based on Golden Sunlight Mine's previous operational track record it is very clear that they are good stewards of the land and go the "extra mile" to protect the environment. In past years they have been leaders in developing and perfecting new reclamation and environmental monitoring technology.

Response to Letter 47

47-1 Comment noted. Please see the Responses to Comments 16-37 and 23-5.

Letter 47 Continued

Golden Sunlight Mine's has always been a very strong supporter of the community through monetary donations and direct involvement by Golden Sunlight Mine employees.

As a employee of Montana Resources and a representative of the World Museum of Mining where I presently serve as President, I strongly urge the B.L.M. and D.E.Q. to expeditiously proceed with the preparation of the Final E.I.S. allowing Golden Sunlight Mine to proceed with [illegible] expansion.

Sincerely,

John V. Burk
Manager of Environmental and Permitting

JVB/deb

Response to Letter 47

Letter 48

O'KEEFE
DRILLING

P.O. Box [illegible] · Butte, Montana · [illegible] · [illegible] · Fax [illegible]

December 11, 1997

Mr. Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
P.O. Box 200901
Helena, Montana 59620

RECEIVED
JAN 17 1998
MT. DEPT. OF ENV. QUALITY
PERMITTING & COMPLIANCE DIV.

Dear Mr. Hallsten,

I am writing in support of the Golden Sunlight Mine's request for an expansion permit for the Whitehall operation. Without the expansion permit, the mine will not be able to operate at it's full potential. This may result in cut backs and layoff that will have a detrimental effect on the area economy and more importantly the families that the mine supports. Both Whitehall and Cardwell School districts are largely supported by Golden Sunlight tax dollars. Loss of tax dollars to school districts as a result of cutbacks has a negative impact on the schools affecting the children initially and the community over the long term. Strong reputable industries are hard to replace in rural communities.

Golden Sunlight is a conscientious mine operation that takes steps to assure protection of our environment. This strong commitment to the environment is reflected in the mine's reclamation and wildlife habitat activities. Golden Sunlight reclamation efforts not only help to control erosion but also use native grasses for reseeding to help return the area to it's former state. The wildlife habitat activities are evident by the herds of antelope and deer that can be seen grazing the property along I-90. The Waste Water Management Plan of the mine provides for mixing zones that ensure water quality standards are maintained.

I strongly urge you to support the expansion permit to help support our local economy. Golden Sunlight not only employs over 200 workers, but also provides incomes for the various area suppliers of goods and services such as ours. O'Keefe Drilling has billed over $10,000 this year to Golden Sunlight which enables Montana men to keep working in Montana. O'Keefe Drilling employees around 75 people with the majority of work being provided by mines such as the Golden Sunlight. Your support is needed to keep our economy strong.

Sincerely,

Bob Chamberlin

Bob Chamberlin

Response to Letter 48

Thank you for your letter. No response necessary.

Letter 49

NORTH WEST

RECEIVED
DEC 17 1997
MT. DEPT OF ENV QUALITY
PERMITTING & COMPLIANCE DIV

Mr Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
PO Box 200901
Helena, MT 59620

Dear Mr. Williams

This letter is in support of Golden Sunlight Mine's expansion permit. Permit No 00065

I believe that in the past Golden Sunlight Mine has always been very concerned about the environment. Witness yourself the amazing herd of deer that call the mine property home.

Please expedite the EIS process. As a supplier to Golden Sunlight I can attest to the huge impact that a successful mine can have the economy. Golden Sunlight is my largest customer.

Please expedite the Final EIS and issue the ROD as quickly as possible.

Sincerely,
Phillip J Hard
Northwest Parts and Rigging

PRENTICE
Parts & Rigging Co., Inc.
We Supply the Construction, Mining, Logging Industry with Parts, Sales and Services
P.O. BOX 107 • 55 3RD AVE. E.N. • KALISPELL, MT 59903-0107 • PHONE (406) [illegible]

Response to Letter 49

Thank you for your letter. No response necessary.

Letter 50

FAX - [illegible]
PHONE - [illegible]
AFTER HOURS - [illegible]

PAYNE MACHINERY, INC.

1077 US HWY. 37 LIBBY, MONTANA 59923

December 11, 1997

RECEIVED
DEC 16 '97
MT. DEPT OF ENV. QUALITY
PERMITTING & COMPLIANCE DIV.

Mr. Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
P.O. Box 200901
Helena, Montana 59620

Greg,

Let me be counted as one who supports Golden Sunlight Mines Operating Permit No. 00065 for the continued operation of their Whitehall Mine. Here's why:

The progress of human civilization has primarily been a matter of economics. If a nation, crusade, policy, institution, idea or direction is not economically viable, it simply will not long endure. The proponents of the "Endangered Species Act" can not realistically claim to have saved a single specie from extinction, but what cost has been expended in the attempt. The Environmental Protection Agency has made some progress in the effort to improve the environment, but we must still consider the cost before a celebration is in order. Notable economists estimate the cost of government regulation in the United States is at 600 billion dollars per year. This cost is represented in every product or service we buy. If the resources consumed (and resultant pollution) in the process of paying for these costs are factored in, we could well have a negative benefit to cost ratio.

The problems of endangered species and pollution of our environment can best be solved by limiting the human population growth in the short term and significantly reducing it in the long term. Regulating industry to death may be a popular remedy today for those not directly affected, and ignorant of the consequences, but ultimately the cost of these measures will be borne by all of us.

The flawed science and general hysteria emanating from the liberal press on environmental issues and the "back to nature" remedies proposed by the preservationists do not even consider the economic question. With our country already the worlds largest debtor nation, perhaps we should think about what is going to pay for all these wonderful sounding notions of saving the planet. As you work diligently to close down industry, you might wonder who is going to pay your salary.

Sincerely,

Bill Payne
Bill Payne

Response to Letter 50

Thank you for your letter. No response necessary.

Letter 51

PEGASUS GOLD
ZORTMAN MINING, INC.

RECEIVED
DEC 15 1997
MT. DEPT OF ENV QUALITY

Mr. Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
P.O. Box 200901
Helena, MT 59620

Mr. Dave Williams
BLM - Butte District
Headwaters Resource Area
P.O. Box 59702
Butte, MT 59702

Dear Mr. Hallsten and Mr. Williams,

I am writing to urge you to expedite the issuance of a Final EIS and a favorable Record of Decision for the Golden Sunlight Mine's Operating Permit No. 00065. Timely issuance of the ROD will allow for continued operation of the mine, which will have a positive impact on the area's economy and also provide for important environmental protections.

The Draft EIS has incorporated an appropriate level of technical analysis to select the best alternative and to support a favorable ROD. Golden Sunlight's Water Management Plan and Mixing Zone analysis appear to ensure that water quality will be protected in conjunction with mine operations.

As General Manager of Zortman Mining, Inc., I am all to familiar with the terrible consequences of shutting down mine operations due to permitting delays. Long time employees are severed and forced to relocate their families, remaining employees worry about their future, the county and state tax base is drastically impacted and services are reduced, reclamation cannot be done and it sends a message that legitimate businesses are not welcome in this state.

I urge you not to allow any permitting delays that will interrupt mine operations. The bottom line is that these delays do not improve environmental protection and will actually delay implementation of a good reclamation program. The employees of Golden Sunlight and the citizens of Montana deserve a timely and informed decision in order to continue to receive the positive benefits that are provided by the mine.

[illegible]

Response to Letter 51

Thank you for your letter. No response necessary.

Letter 51 Continued

Once again, your efforts in expediting the Final EIS and issuing a favorable ROD is imperative both from an economic and environmental standpoint. Thank you for consideration of my comments.

Sincerely,

Kevin J. Ryan
General Manager

cc: Ray Lamb, GSM
Jill Andrews, MMA

Response to Letter 51

Letter 52

Rovig Minerals, Inc.

515 First Citizens Bank Building
Billings, Montana 59101
Telephone: (406) [illegible]
Fax: (406) [illegible]

January [illegible], 1998

Mr. Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
P. O. Box 200901
Helena, Montana 59620

Re: Golden Sunlight Mine - Operating Permit No. 00065

Dear Mr. Hallsten:

I would like to register my support for the Golden Sunlight Mine expansion permit. I am a registered professional mining engineer, currently President of the Montana Mining Association, and a former president and founder of Crown Butte Mines, Inc. As such, I believe I have looked at and studied as many mining EIS's as most people in the state and I am convinced the document prepared for Golden Sunlight addresses all issues in a totally competent manner. I am currently operating a smaller mine near the Golden Sunlight and I have had adequate opportunity to observe their operation, interact with their management and witness the community benefits the operation produces for the Whitehall area. I think for the continued good of the workers and the state, the exemplary efforts of the Golden Sunlight Mine should be recognized, accepted, and this endeavor encouraged to proceed.

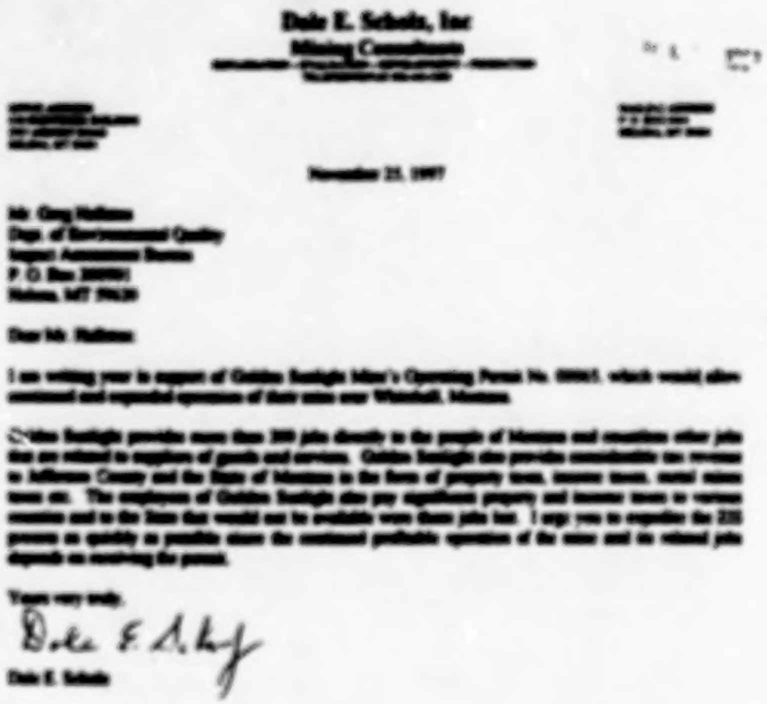
Very truly yours,

David B. Rovig

Response to Letter 52

Thank you for your letter. No response necessary.

Letter 53



Dale E. Scholz, Inc
Mining Consultants
[illegible]

November 21, 1997

Mr. Greg Hallsten
Dept. of Environmental Quality
Impact Assessment Bureau
P. O. Box 200901
Helena, MT 59620

Dear Mr. Hallsten:

I am writing you in support of Golden Sunlight Mine's Operating Permit No. 00065, which would allow continued and expanded operation of their mine near Whitehall, Montana.

Golden Sunlight provides more than 200 jobs directly to the people of Montana and countless other jobs that are related to suppliers of goods and services. Golden Sunlight also provides considerable tax revenue to Jefferson County and the State of Montana in the form of property taxes, income taxes, metal mines taxes etc. The employees of Golden Sunlight also pay significant property and income taxes to various counties and to the State that would not be available were these jobs lost. I urge you to expedite the 235 permit as quickly as possible since the continued profitable operation of the mine and its related jobs depends on receiving the permit.

Yours very truly,

Dale E. Scholz

Dale E. Scholz

Response to Letter 53

Thank you for your letter. No response necessary.

Letter 54

RECEIVED
JAN 21 1998

January 13, 1998

Mr. Greg Hallsten
Montana Department of Environmental Quality
P.O. Box 200901
Helena, MT 59620-0901

Dear Mr. Hallsten:

I write to commend you on your department's thorough environmental impact statement on the proposed continuation of mining at Golden Sunlight—and to support the mine's proposal.

I operate a business in Whitehall, and the fact is that the health and survival of my business -- my own livelihood and that of my employees -- depends on the permitting decision you are finally about to make. We have endured years of uncertainty in this community, and we are anxious for Golden Sunlight to receive the approval it clearly deserves.

I know the mine's employees. They are my neighbors, and I am well aware of the fact that they are operating a modern mine of the highest environmental quality. This community needs these good-paying jobs, and the mine deserves a prompt and favorable permitting decision.

Thank you for the opportunity to participate in this public decision-making process.

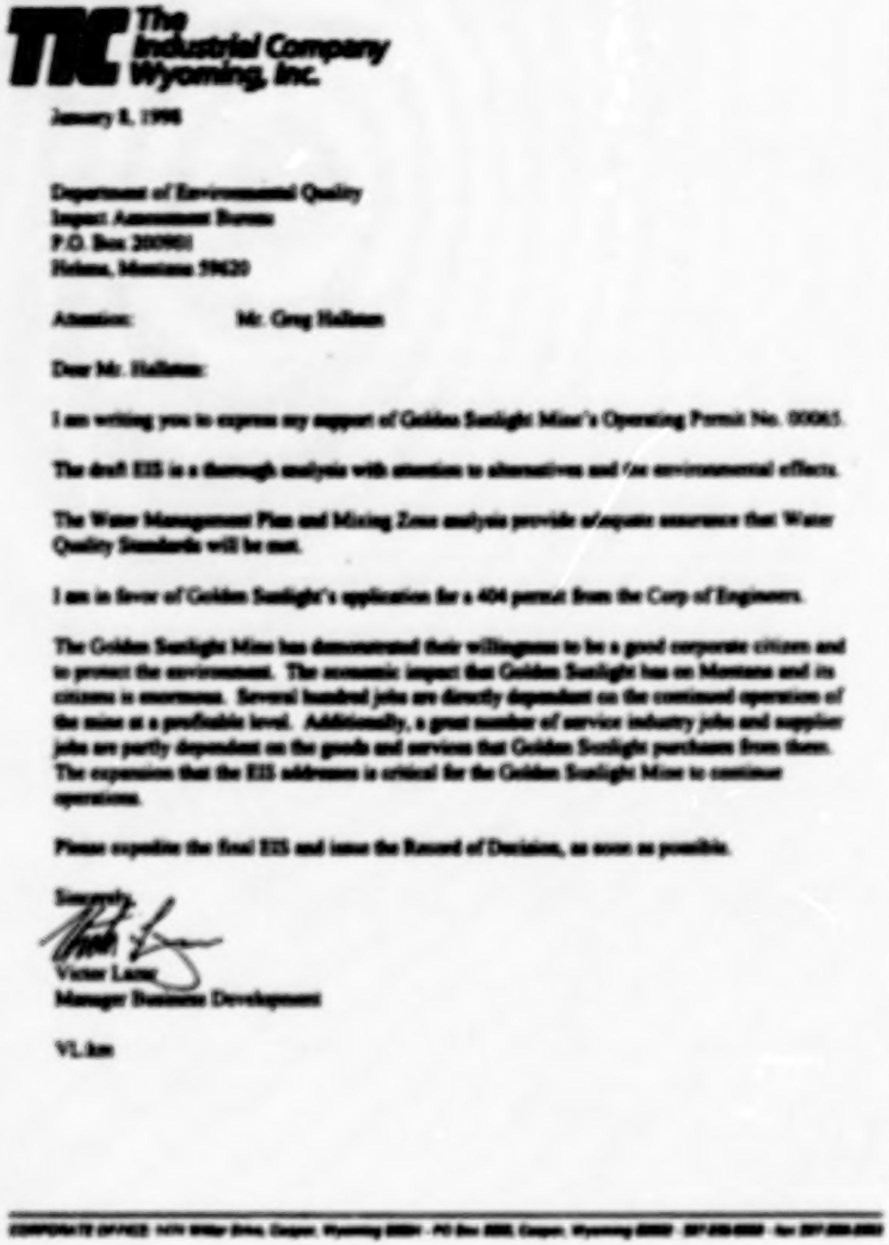
Sincerely,

President T-G's IGA
Whitehall MT

Response to Letter 54

Thank you for your letter. No response necessary.

Letter 55



TIC The Industrial Company Wyoming, Inc.

January 8, 1998

Department of Environmental Quality
Impact Assessment Bureau
P.O. Box 200901
Helena, Montana 59620

Attention: Mr. Greg Hallsten

Dear Mr. Hallsten:

I am writing you to express my support of Golden Sunlight Mine's Operating Permit No. 00065.

The draft EIS is a thorough analysis with attention to alternatives and the environmental effects.

The Water Management Plan and Mixing Zone analysis provide adequate assurance that Water Quality Standards will be met.

I am in favor of Golden Sunlight's application for a 404 permit from the Corp of Engineers.

The Golden Sunlight Mine has demonstrated their willingness to be a good corporate citizen and to protect the environment. The economic impact that Golden Sunlight has on Montana and its citizens is enormous. Several hundred jobs are directly dependant on the continued operation of the mine at a profitable level. Additionally, a great number of service industry jobs and supplier jobs are partly dependant on the goods and services that Golden Sunlight purchases from them. The expansion that the EIS addresses is critical for the Golden Sunlight Mine to continue operations.

Please expedite the final EIS and issue the Record of Decision, as soon as possible.

Sincerely,

Victor Lane
Manager Business Development

VL:km

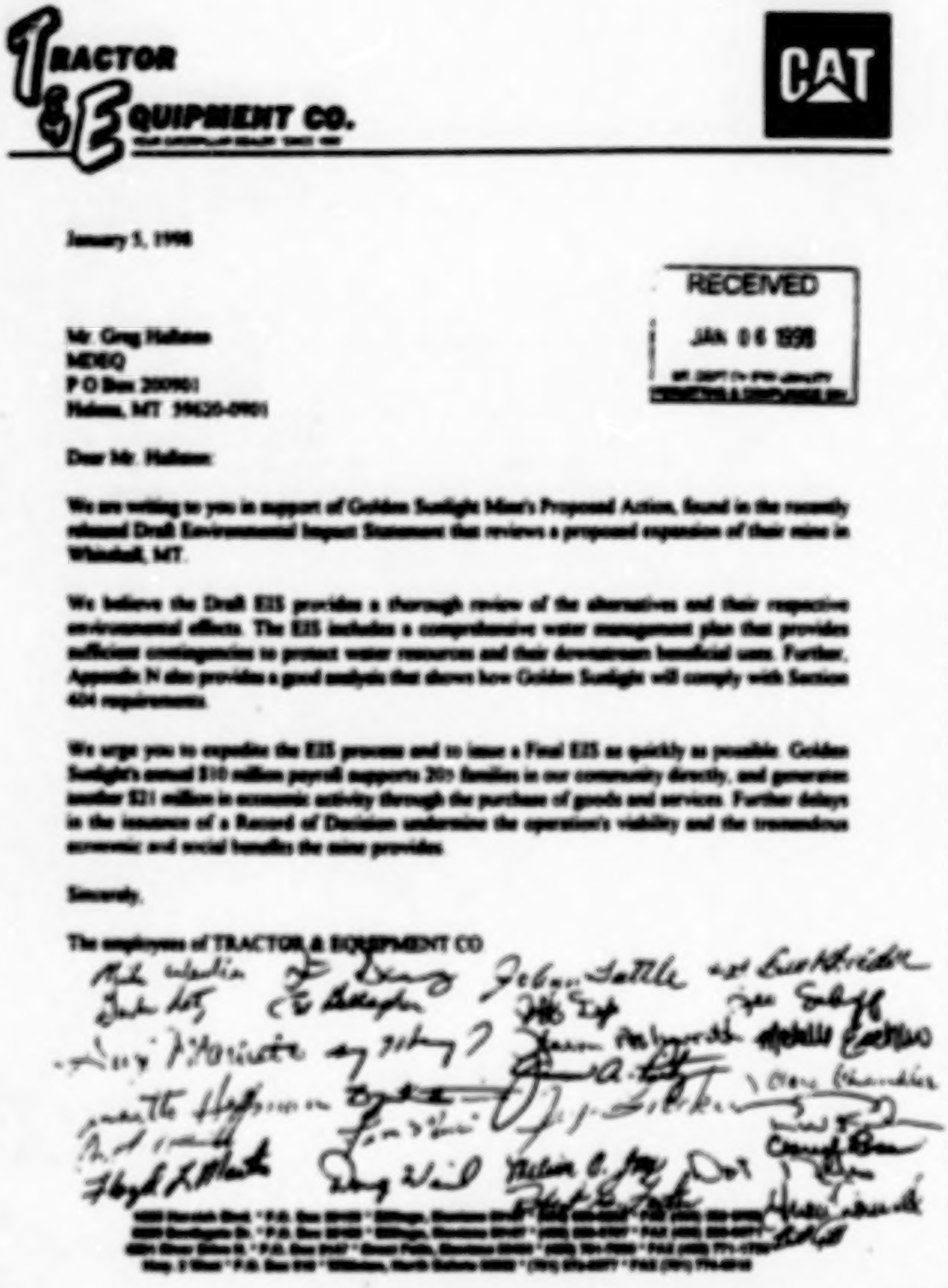
CORPORATE OFFICE: [illegible] Casper, Wyoming [illegible] · PO Box [illegible] Casper, Wyoming [illegible] · [illegible] · fax [illegible]

184

Response to Letter 55

Thank you for your letter. No response necessary.

Letter 56



TRACTOR & EQUIPMENT CO.

CAT

January 5, 1998

RECEIVED
JAN 06 1998
MT DEPT OF ENV QUALITY
PERMITTING & COMPLIANCE DIV.

Mr. Greg Hallsten
MDEQ
P O Box 200901
Helena, MT 59620-0901

Dear Mr. Hallsten:

We are writing to you in support of Golden Sunlight Mine's Proposed Action, found in the recently released Draft Environmental Impact Statement that reviews a proposed expansion of their mine in Whitehall, MT.

We believe the Draft EIS provides a thorough review of the alternatives and their respective environmental effects. The EIS includes a comprehensive water management plan that provides sufficient contingencies to protect water resources and their downstream beneficial uses. Further, Appendix N also provides a good analysis that shows how Golden Sunlight will comply with Section 404 requirements.

We urge you to expedite the EIS process and to issue a Final EIS as quickly as possible. Golden Sunlight's annual $10 million payroll supports 200 families in our community directly, and generates another $21 million in economic activity through the purchase of goods and services. Further delays in the issuance of a Record of Decision undermine the operation's viability and the tremendous economic and social benefits the mine provides.

Sincerely,

The employees of TRACTOR & EQUIPMENT CO

Floyd L. Mark

Response to Letter 56

Thank you for your letter. No response necessary.

Letter 57

TRACTOR & EQUIPMENT CO.

CAT

January 5, 1998

RECEIVED
JAN 08 1998
[illegible]

Mr. Dave Williams
BLM - Butte District
Headwaters Resource Area
P O Box 3388
Butte, MT 59702

Dear Mr. Williams:

We are writing to you in support of Golden Sunlight Mine's Proposed Action, found in the recently released Draft Environmental Impact Statement that reviews a proposed expansion of their mine in Whitehall, MT.

We believe the Draft EIS provides a thorough review of the alternatives and their respective environmental effects. The EIS includes a comprehensive water management plan that provides sufficient contingencies to protect water resources and their downstream beneficial uses. Further, Appendix N also provides a good analysis that shows how Golden Sunlight will comply with Section 404 requirements.

We urge you to expedite the EIS process and to issue a Final EIS as quickly as possible. Golden Sunlight's annual $10 million payroll supports 205 families in our community directly, and generates another $21 million in economic activity through the purchase of goods and services. Further delays in the issuance of a Record of Decision undermine the operation's viability and the tremendous economic and social benefits the mine provides.

Sincerely,

The employees of TRACTOR & EQUIPMENT CO.

[illegible]

Response to Letter 57

Thank you for your letter. No response necessary.

Letter 58

CARL WEISSMAN & SONS
INCORPORATED

CORPORATE OFFICES • [illegible] THIRD ST SOUTH • P.O. BOX [illegible] • GREAT FALLS, MONTANA [illegible] • PHONE [illegible]

RECEIVED
DEC 05 1997
DEQ

December 3, 1997

Mr. Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
PO Box 200901
Helena, Montana 59620

RE: Golden Sunlight Mine's Operating Permit no.00065

Dear Mr. Hallsten:

I am writing you to voice our support of the continuation and expansion of Golden Sunlight Mine's operation at Whitehall, Montana.

The prepared draft on E.I.S. is well done and answers to the issues with technical data regarding the environmental effects of this proposal.

Water Management Plan and Mixing Zone method ensure that the Water Quality Standards will be met.

I believe from their past history of operation Golden Sunlight Mine has demonstrated that their intention is to comply with all of the 404 requirements set by the Corps of Engineers.

I would urge you to speed along the E.I.S. process and issue the R.O.D. in a timely manner as not to burden the profitability of the mine, the work force, school districts, suppliers, and contractors.

Sincerely,

Dennis Campbell

FACSIMILE [illegible]
TOLL FREE 1-[illegible]

Response to Letter 58

Thank you for your letter. No response necessary.

Letter 59

Whitehall Medical Clinic
Terry [illegible], D.O.
Gayle Berry, M.D.
Box [illegible]
Whitehall, Montana 59759
Phone [illegible]

January 16, 1998

RECEIVED
JAN 21 1998
[illegible]

Mr. Greg Hallsten
MDEQ
P.O. Box 200901
Helena, MT 59620-0901

Dear Mr. Hallsten:

I am writing you in support of the Golden Sunlight Mine's Proposed Action to expand their mine in Whitehall. I have recently spent some time reviewing their Draft Environmental Impact Statement and must say that I found it very professionally done, very thorough and that it very competently addressed the issues.

Golden Sunlight Mine has been a great asset to Southwest Montana particularly Jefferson County and more specifically to the town of Whitehall. One has to be concerned, of course, about the reclamation process. However, having lived in the Whitehall area for fifty years and having observed the Sunlight Mine area over these years, I would have to say that is Golden Sunlight Mine plans to do a much better job of reclamation and beautifying the area than has ever been accomplished before. I can remember old mine shafts, old roads, old buildings, old equipment scattered all over that hill for years and years. Golden Sunlight Mine is doing an exceptional job of preserving the area. This is from the esthetic stand point as well as for wild life habitat and plant restitution.

Golden Sunlight Mine has been an exceptional partner for Jefferson County and Whitehall, Montana. They have been very generous contributors to the area. Examples of this include the home that they donated to Jefferson Valley Habitat for Humanity and the donations that they have made on a number of occasions to the Whitehall School system and to other community organizations around town. They also are willing partners in local activities not the least of which are their contributions to the local ambulance service and emergency medical response.

There is no question whatsoever in my mind that the Golden Sunlight Mine will fulfill all of their obligations to meet any environmental and reclamation issues. I know most of the mine employees personally and feel very comfortable with their desire to comply with the necessary requirements of reclamation, water safety and wild life habitat.

I would encourage you to assist in expediting the proposed expansion plans.

Sincerely yours,

G Berry MD

Gayle Berry, M.D.

Response to Letter 59

Thank you for your letter. No response necessary.

Letter 60

P.O. Box 1147
Three Forks, Montana 59752
December 18, 1997

RECEIVED
DEC 22 1997

Mr. Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
PO Box 200901
Helena, Montana 59620

Dear Mr. Hallsten:

I am writing in support of Golden Sunlight Mines expansion permit. The draft EIS thoroughly addresses all the environmental effects the mine's continued operation would have on the surrounding water sources and animal habitat.

GSM's water management plan appears to be very detailed and well thought out. The plan protects surrounding water sources. I support the mixing zone analysis. It is a common sense approach to protect downstream water uses.

60-1 GSM's open mine pit is there and isn't going to go away whether the EIS is approved or not. Partial back filling the pit will have little environmental impact. Water will still have to be handled with or without backfilling and there will be no advantage to wildlife habitat or air quality. Total mine site reclamation will be 2,500 acres. To back fill the pit will cover approximately 235 acres of highwall. It's ridiculous to require GSM to backfill their pit!

GSM's environmental and engineering personnel are competent, conscientious, and dedicated to reclaiming the mine site. This has been proven by GSM's past and current steep-slope reclamation activities, innovative erosion controls, and seeding practices. Soil scientist Tony Smith has implemented seeding of native grasses, shrubs, and trees. To determine optimum slope angle and suitable capping materials for minimum erosion and water infiltration, Mr. Smith has conducted extensive slope reclamation studies on waste rock test plots. In short, GSM's staff has proven that they are dedicated to and knowledgeable about reclaiming the minesite. They realize to be able to work and live in Montana, mining companies must operate in an environmentally conscientious manner.

Please issue a final EIS. Let the mine continue to provide jobs, pay taxes, and support our local schools. GSM is willing to comply with Montana's environmental and mining laws. I see no reason for the state of Montana to deny Golden Sunlight their expansion permit. Thank you.

Sincerely,

Gail B. Amicucci
Gail B. Amicucci

Response to Letter 60

60-1 Comment noted. Please see the Response to Comment 23-5.

Letter 61

January 19, 1998

Marilyn Bartlett
3030 Nettie St.
Butte, MT 59701

Mr. Greg Hallsten
Montana Department of Environmental Quality
P.O. Box 200901
Helena, MT 59620-0901

RECEIVED
JAN 21 1998
MT. DEPT OF ENV QUALITY
PERMITTING & COMPLIANCE DIV.

Mr. Hallsten:

I am the Administrative Superintendent for Golden Sunlight Mines, Inc. and a Certified Public Accountant, Certified Management Accountant and Certified in Financial Management. I provided socio-economic and financial information used in the analysis for the draft Environmental Impact Statement (DEIS).

In my opinion, the draft EIS correctly analyzed and concluded that pit backfilling is not feasible. The final EIS should reach the same conclusion. In addition, I believe the draft EIS appropriately addresses other environmental issues, including waste dump design, water treatment, and air quality.

Sincerely,

Marilyn J. Bartlett

Marilyn J. Bartlett

Response to Letter 61

Thank you for your letter. No response necessary.

Letter 62

November 25, 1997

To: Greg Hallsten
Montana Department of Environmental Quality
PO Box 200901
Helena, MT
59620-0901

Dear Mr. Hallsten,

I am writing in regards to the Draft Environmental Impact Statement for Golden Sunlight Mines near Whitehall, Montana. I want to endorse the preferred alternative, "Proposed Action as modified by the Return Diversion and No Pit Pond alternatives".

This alternative strikes a good balance and is quite reasonable.

Thank you for allowing my comments.

Sincerely,

Dan Baker

Dan Baker
2860 Harrison
Butte, MT
59701

Response to Letter 62

Thank you for your letter. No response necessary.

Letter 63

RECEIVED
DEC 17 1997
[illegible]

December 11, 1997

To: Mr. Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
PO Box 200901
Helena, Montana 59620

Dear Sir,

The proposed action (preferred alternative) on The Environmental Impact Statement for Golden Sunlight Mines is a good one. I am convinced that it addresses water management and water resource concerns with solid science. I am employed at Golden Sunlight Mines and know that its environment staff is of the highest quality. The work GSM has done will comfortably cover all 404 requirements.

Please see your way to expedite all efforts in issuing a final EIS for our mine. The future of many families depend on the outcome of this document.

Sincerely,

Dana Bauer

Dana Bauer
2860 Moulton St.
Butte, Montana
59701

Response to Letter 63

Thank you for your letter. No response necessary.

Letter 64

January 7, 1998

RECEIVED

JAN 12 1998

[illegible]

Mr. Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
P.O. Box 200901
Helena, MT 59620

Mr. Dave Williams
BLM - Butte District
Headwaters Resource Area
P.O. Box 3388
Butte, MT 59702

Dear Mr. Hallsten or Williams,

I am writing in support of the expansion of the Golden Sunlight Mine in Whitehall, MT. I believe Golden Sunlight should be allowed to continue and expand mining operations.

Golden Sunlight Mining (GSM) has been a good neighbor to Montana. GSM has displayed strong commitment to protect the environment through the past reclamation and habitat preservation activities it has conducted. GSM has innovated special seeding techniques and erosion controls, for steep-slope reclamation projects. By planting native trees, shrubs, and grasses, GSM has contributed diverse wildlife forage and cover. Because GSM has been a good neighbor in the past, I believe it will continue to be in the future, as well.

64-1 Mitigation Measures WT-4 is unrealistic. It could force the mine to suspend operations for up to three months. GSM has already provided several thousand acres of habitat for nesting birds. This mitigation measure is senseless, and would not be worth the trouble it would cause.

GSM generates an abundance of money for the State of Montana. Last year alone, GSM paid more than $700,000 in property taxes; more than $349,000 in Gross Proceeds Taxes; and $720,000 of Metalliferous Mines Tax. Golden Sunlight is responsible for 67% of Cardwell School District and 32% of Whitehall School District taxable value. GSM provides jobs for more than 200 people, and has an annual payroll of $10 million. Not only is it good for providing 200+ jobs, but the company purchases millions in goods and services.

Response to Letter 64

64-1 Comment noted. Please see the Response to Comment 23-2.

Letter 64 Continued

Please consider what I have stated, and expedite the EIS process as quickly as possible. Delays have already negatively impacted Golden Sunlight's operations. From what I have seen in similar EIS processes, delays have proven to be not only a detriment to the company directly involved, but also to the employees, those who supply goods and services, and to the State of Montana.

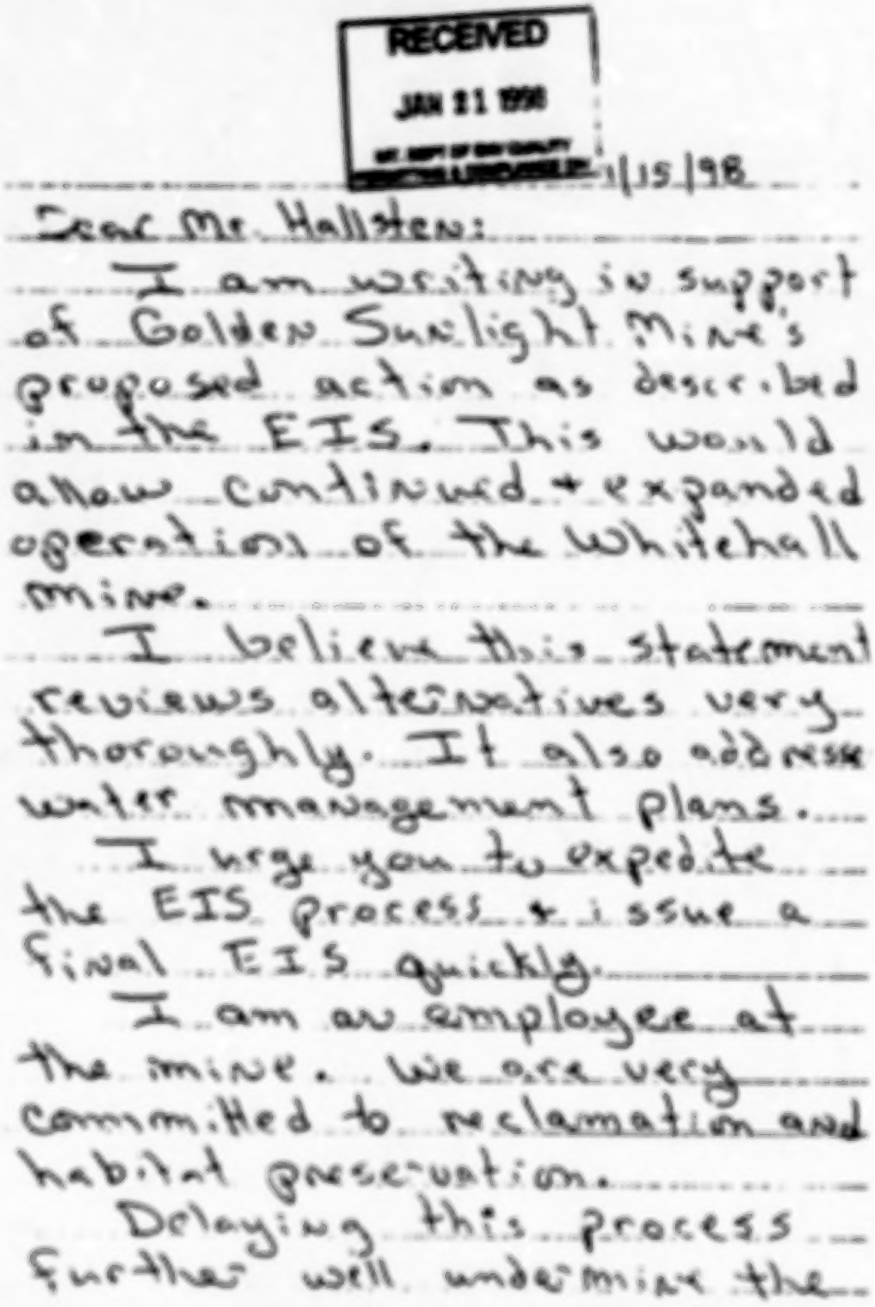
Thank You,

Tamara Bellon

Tamara Bellon
Concerned Montana Citizen

Response to Letter 64

Letter 65



RECEIVED
JAN 21 1998

1/15/98

Dear Mr. Hallsten:

I am writing in support of Golden Sunlight Mine's proposed action as described in the EIS. This would allow continued + expanded operation of the Whitehall mine.

I believe this statement reviews alternatives very thoroughly. It also addresses water management plans.

I urge you to expedite the EIS process + issue a final EIS quickly.

I am an employee at the mine. We are very committed to reclamation and habitat preservation.

Delaying this process further will undermine the

Response to Letter 65

Thank you for your letter. No response necessary.

Letter 65 Continued

~~[illegible]~~ [illegible]
mines future. The mine is a tremendous economic + social benefit to the area. There is an annual $10 million payroll + of course lots of tax dollars involved.

Thank you very much for taking time to read this letter.

Sincerely,

Tassa L Boldi
P.O. Box 723
Silver Star, Mt
59751

Response to Letter 65

Letter 66

Mr. Greg Hallsten
Department of Environmental Quality
P.O. Box 200901
Helena, Montana 59620-0901

RECEIVED
DEC 18 1997
[illegible]

Dear Mr. Hallsten:

My name is Greg Briggs. I have been employed at Golden Sunlight Mine for the past six years. Mining has provided the majority of my family income since I graduated from high school in 1969.

Even though my family and the hope of getting my son a college education depends upon my employment in the mining industry, I can support GSM's proposed draft EIS with a clear conscience. I have observed first hand the support and sound stewardship GSM has for the environment.

66-1 1. I do not support the partial backfill alternative. It would be a waste of fuel and labor that would be better used to increase the production of products for our country. Partial or complete backfilling would not improve wildlife habitat or air quality. It would be extremely expensive and unnecessary. Reserves of gold would be eliminated for future mining. The survival of our country depends upon the use and availability of our natural resources.

66-2 2. I oppose the Mitigation Measure WF4 to protect bird habitat by avoidance. Birds nest in the eaves and on the light fixtures of our dry building. Several people pass their nests within a foot or two several times a day. The birds thrive and survive. They leave at the proper time with no known harm because of human activity.

3. I support GSM's proposal for a mixing zone. Down stream users will have clean safe water.

3115 Edwards
Butte, Mont 59701 [illegible]

Sincerely, Greg Briggs

Response to Letter 66

66-1 Comment noted. Please see the Responses to Comments 16-37 and 23-5.

66-2 Comment noted. Please see the Response to Comment 23-2.

Letter 67

Mr. Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
P.O. Box 200901
Helena, MT 59620

RECEIVED
DEC 22 1997
MT. DEPT OF ENV QUALITY
PERMITTING & COMPLIANCE DIV.

Dear Mr. Hallsten:

I am writing to you in support of Golden Sunlight Mining proposed action as described in the EIS, which would allow continued and expanded operation of their mine in Whitehall, Montana.

I believe the draft Environmental Impact Statement provides a thorough review of the alternatives and their respective environmental effects. The EIS included a comprehensive water management plan that provides sufficient

Response to Letter 67

Thank you for your letter. No response necessary.

contingencies to protect water
resources and their downstream
beneficial uses.

As one of the 208 employees
of Golden Sunlight I can attest
to the Mine's commitment to
reclamation and habitat preservation.
The EIS clearly demonstrates that
Golden Sunlight will comply with
all sections of the 404 requirements.

I urge you the expedite the
EIS process and to issue a final
EIS as quickly as possible.
Golden Sunlight's annual $10 million
payroll supports 208 families in
my community directly, and
generates another $21 million in
economic activity through its
purchases of goods and services.
Further delays in the issuance
of a Record of Decision undermine
the operations viability and the

Letter 67 Continued

tremendous economic and social benefit the mine provides.

Sincerely, Mark Briggs
& Family

Response to Letter 67

Letter 68

RECEIVED

JAN 14 1998

[illegible]

January 7, 1998

Greg Hallsten
Montana Dept of Environmental Quality
P.O. Box 200901
Helena MT 59620

Dear Mr Hallsten:

I am writing in favor of the Golden Sunlight Mine Draft EIS Document, which I have in hand. The document seems well put together and thorough for all practical purposes. As for why I am writing... in addition to having a business in Butte that relies solely on mining... I represent another special interest group as well: The American people who feed off of the food chain started by responsible natural resources development.

We appreciate efficient resource groups such as Golden Sunlight that for years have created economic sustenance for many, while at the same time being responsible to society and the environment in which we live. Now I hear that some want their pit backfilled, etc..... which is as practical and as necessary as putting sails on a car. I used to think those who oppose mining at every turn needed education to the facts of modern production and reclamation. But that is not the case. Rather these ivory tower antagonists of our society put forward a cunning and calculated strategy to hit mining below the belt at every opportunity. Their tone is clear and their rhetoric is mindful of the mob who for the space of two hours rent their clothes and threw dust in the air because the Apostle Paul had come to their town and opposed the philosophy of a few... who stirred up the mob. The end of all this is that I (and a lot of other environmentally responsible persons) wish you would look at the facts in a practical manner and not let the distorted enviro philosophy of opponents of resource development... keep you from doing the right thing for America.

If you balance what the mine does for our society plus what the company has and is doing for wildlife habitat, against the few acres of disturbance (to be reclaimed in an economically practical manner), one's decision must favor Golden Sunlight's expansion and consequent Draft EIS. Likewise the Mine's plan for water management is well considered and goes an extra mile in mitigation of potential concerns. I would also point out how quickly nature heals itself. Look at Mt St Helens; or fish Panther Creek below the Cobalt, Idaho, mine site; or check out the deer and elk calving at Beal (MT) or Beartrack Mine (ID), things I've seen myself in my short lifetime.

I urge you to consider the facts in a practical manner and recall that the intent of law is to benefit our society. That includes environmental and technical aspects of water "quality" considerations. Please be decisive in allowing the Draft EIS of the Golden Sunlight Mine Plan to move forward quickly.

Sincerely,
Ken Bright.

K Bright

201

Response to Letter 68

Thank you for your letter. No response necessary.

Letter 69

RECEIVED
DEC 15 1997

Dear, Mr. [illegible]

I'm writing you this letter to voice my concerns about the Golden Sunlight Mine receiving their permits.

I believe that the EIS includes a comprehensive water management plan to protect water resources and that they will comply with section [illegible] requirements.

The Golden Sunlight provides an annual income of $10 million in payroll and supports 285 families in my community.

Further delay in the Record of Decision would jeopardize the future of the GSM. Instead we need to look at the big picture and see how many good things come from the operation of the Golden Sunlight Mine.

They have purchased over 9,300 acres of off-site land and leased an additional 1900 acres of off-site land to preserve open space and wildlife habitat around the mine site.

69-1 Requiring GSM to backfill their open pit to cover 285 acres of pit highwall is absurd.

Thank you

P.O. Box 554
Whitehall, MT
59759

Response to Letter 69

69-1 Comment noted. Please see the Responses to Comments 16-37 and 23-5.

Letter 70

Dec 11 1997.

Mr. Greg Hallsten
#200
P.O. Box 200901
Helena, MT. 59620-0901

RECEIVED
DEC 13 1997
[illegible]

Dear Mr. Hallsten:

After reviewing the Golden Sunlight Mine Draft EIS I find that it is an extremely thorough document. I am in full support of the Agencies' proposed action, which is supported by ample technical information.

70-1 The partial pit backfill alternative should not be considered on basis of little environmental benefit. The draft EIS supports this from a technical point as water will still have to be handled. This action would force a premature closure of the mine having substantial impact on economy of the State.

Water management mixing zone analysis is detailed and provides sufficient contingencies to protect water quality.

At this time it is of extreme importance to expedite completion of the Final EIS as delays will jeopardize operation of the mine. I urge the DEQ and BLM expedite the preparation of the Final EIS by incorporating the Draft EIS as is.

Sincerely,
Paul Buckley
Whitehall.

Response to Letter 70

70-1 Comment noted. Please see the Response to Comment 23-5.

Letter 71

Dec 11, 1997

Mr. Greg Hallsten
Dept of Environmental Quality
Project Assessment Bureau
Po Box 200901
Helena Montana 59620-0901

RECEIVED
DEC 15 1997

Dear Mr Hallsten.

I am writing to add my support to the Operating Permit No 00065 of the Golden Sunlight Mine, which would allow continued and expanded operations of this mine site in Whitehall Montana.

This EIS draft appears to have used the large amount of monies necessary to prepare it, to provide a look of technical analysis and environmental effects to appease the most discriminant of environmentalist. However, we too care about the earth, air and water and plan on living here a long time.

The Golden Sunlight mine through this EIS have addressed concerns about water quality and

Response to Letter 71

Letter 71 Continued

and have plans to ensure that Water Quality Standards are met and protected. They have also shown a willingness to comply with all 404 requirements for that permit.

So what is the problem here? And why is this
71-1 process that is so important to the continued life of the mine taking so long? The Golden Sunlight Mine has operated in a responsible manner, used its resources to develop public access, established training facilities and provided animal habitat. They have been good neighbors to our community, and treated our men as valued employees. Please help us to continue with the wonderful life style that has been allowed to grow here by expediting the final EIS issue and ROD as quickly as possible.

Thank you

Richard and [illegible]

Response to Letter 71

71-1 Please see the Response to Comment 29-1.

Letter 72

December 15, 1997

RECEIVED
DEC 15 1997
MT. DEPT OF ENV QUALITY
PERMITTING & COMPLIANCE DIV.

Mr. Greg Hallsten
Dept. of Environmental Quality
Impact Assessment Bureau
P. O. Box 200901
Helena, MT 59620

RE: Golden Sunlight Mines, Inc. draft EIS

Dear Mr. Hallsten:

Please enter this letter in support of the EIS for Golden Sunlight Mine's Proposed Action Alternative, which would allow continued and expanded operation of the mine near Whitehall, Montana.

The draft EIS is a well-prepared and thorough document that provides a high level of technical information evaluating the potential impacts from the mine's expansion. Since I am an employee at the mine and have an intimate knowledge of the document, I am in full support of the Proposed Action.

The Water Management Plan and Mixing Zone analysis has addressed ways to ensure that Water Quality Standards are achieved and is the the best alternative to permit. I am also in support Golden Sunlight's 404 permit application from the Army Corps of Engineers and believe the company has demonstrated a willingness to comply with all 404 requirements.

72-1 I am concerned with Measure WF-4, the bird nesting avoidance measure, as this apparently simple mitigation measure could force Golden Sunlight to suspend its operations. The end-of-spring and first part of summer months are crucial to meeting GSM's committed soil salvage requirements. This mitigation measure should not be considered in the final EIS.

72-2 I am also concerned with the Return Diversion alternative. Erosion is a natural process that will occur in Corrow Creek regardless of the additional water volume diverted from Sheep Creek. By keeping the Sheep Creek water in the drainage there is less risk of picking up ARD. This mitigation measure should not be considered in the final EIS.

Golden Sunlight Mines, Inc. provides more than 200 jobs important economy based jobs to the people of Montana and the countless other jobs that are related to suppliers of goods and services. Golden Sunlight also provides considerable tax revenue to Jefferson County and the State of Montana in the form of property taxes, income taxes, metal mines taxes, etc. The employees of Golden Sunlight also pay significant property and income taxes to various counties and to the State that would not be available if those jobs lost. To risk the source of economic stability because of the antimining extremist agenda of the environmentalists opposing the EIS is disgraceful. I urge you to expedite the EIS process as quickly as possible since the continued profitable operation of the mine and its related jobs depends on receiving the permit.

Paul Daie

85 WHITETAIL RD
P.O. BOX 343
WHITEHALL, MT 59759

206

Response to Letter 72

72-1 Comment noted. Please see the Response to Comment 23-2.

72-2 Comment noted. The benefits of the Return Diversion Alternative are described in Sections II.B.3 and IV.B.3. The agencies have selected this alternative as part of their preferred alternative (see page xxvi in the Summary.)

Letter 73

December 10, 1997

RECEIVED

DEC 15 1997

Mr. Greg Hallsten
Dept. of Environmental Quality
Impact Assessment Bureau
P.O. Box 200901
Helena, MT 59620

Dear Mr. Hallsten:

I ask to be entered into the public record in support of the EIS for the Golden Sunlight Mine Expansion with the Preferred Alternative Plan.

I am a spouse of an employee of Golden Sunlight and we have lived in Whitehall for 14 years. We have raised our 3 children in Whitehall within site of the mining operation with no trace of environmental degradation. When I see the mine waste dumps from my driveway everyday, I do not look upon them with contempt or threat, this is basic industry at work in our community and our lives. The elitists who oppose the continued operation of the mine to further their own hypocritic selfish idea of utopia should be given no credibility.

I have been party to the hard work and level of expertise that the professionals at GSM have put into protecting the environment and putting together the EIS that is so casually dismissed by these zealots. Please don't be fooled by their agenda to choke off mining at GSM and in Montana under the screen of requiring pit backfilling. The EIS is sound and you have done the right thing by selecting the preferred alternative.

I urge your agency to move expediently and approve the EIS so the lives of the employees and their families can get this anxiety behind them. It is shameful that the livelihoods and futures of these hardworking families should be threatened by these selfish extremists.

Sincerely Yours,

Rhonda Dale

Rhonda Dale
P.O. Box 242
Whitehall, MT 59759

Response to Letter 73

Thank you for your letter. No response necessary.

Letter 74

Richard T. Dale, P.E.
175 Yellowstone Trail
Whitehall, MT 59759

RECEIVED
JAN 22 1998
MT DEPT OF ENV QUALITY
[illegible]

January 17, 1998

Mr. Greg Hallsten
Montana Department of Environmental Quality
P.O. Box 200901
Helena, MT 59620-0901

Dear Mr. Hallsten:

This letter is written in support of Golden Sunlight Mine's proposal for a permit that will allow the mine to keep operating.

The Draft Environmental Impact Statement(DEIS) which your agency released November 21, 1997 is probably the most complete and technically sound EIS ever done in Montana. This conclusion is based on my experience with and participation in the preparation of a number of EIS documents on other mining and industrial projects.

My 20-year career in the mining industry has given me the opportunity to observe permitting, mining, reclamation and environmental protection practices in the United States, South America and parts of Europe. I am now employed by the Golden Sunlight Mine and I can tell you without reservation that the employees of this mine are the most environmentally conscientious group of employees I have ever seen at a mining operation. In view of the operating history and their environmental protection, habitat enhancement and reclamation achievements at this mine, their frustration with the permitting process is understandable. It is now time to acknowledge the patience of this community and these employees and to recognize their willingness to participate productively in such a difficult, costly and drawn-out process by moving quickly and diligently to the granting of the permit.

I believe all MEPA and NEPA requirements have been met and the process has produced an EIS document that clearly indicates that permitting either the proposed or the agency preferred alternative is the right thing to do. Thank you for considering my comment.

Sincerely,

Richard T. Dale

Richard T. Dale

Response to Letter 74

Thank you for your letter. No response necessary.

Letter 75

RECEIVED
DEC 31 1997
[illegible]

Greg Hallsten
Dept of Environmental Bureau
Impact Assessment Bureau
P.O. Box 200901
Helena ,Mt. 59620

Dear Sir,

This is a letter of total support for the proposed expansions permit for the Golden Sunlight Mine, near Whitehall Montana. The detailed EIS that they have done ,in such detail, gives support to the truth that they do have a credible plan of reclamation, and operations safety with total concern for the environment. This scientific document (the EIS) shows the extra effort and the total professionalism these people have in running a modern and responsible operation.

I ask that no more delays are introduced into the process and that you issue the Permit on the current schedule set forth. This is a very reliable organization that has been nothing but a good neighbor to southwestern Montana. This state needs the economic boost and the high paying jobs, this mine provides. It means that Montana families can stay in Montana, and build a future in the state they love so much. And with their continued way of life they add to the entire Montana community with economic values, and strong based family values, that allow children to afford to go to college and continue the Montana traditional way of life. Thus building a strong future for the state.

The EIS, in itself, provides scientific data and engineering details, that shows this organization is very responsible and has a definite plan that will work in protecting the environment. I live in Whitehall and I can swear to you that I would not support an operation that would destroy the habitat and leave a mess for the future people of Montana to have to clean up. THESE ARE RESPONSIBLE PEOPLE AND THIS IS A VERY RESPONSIBLE PLAN. I URGE YOU TO ISSUE THESE PERMITS WITHOUT ANY FURTHER DELAYS.

Any further delays would put their very existence in jeopardy, and that is what radical environmental groups have in mind when they try to hold up the process. You need to keep in mind that these groups offer nothing to the future of Montana economic strength and why don't they work to help provide better process and help our industries to improve. They have taken the path that is to shut down and leave no future for working families to stay in Montana, and provide their children with the Montana way of life. They offer nothing to better the school systems, nothing to the tax base, and nothing in form of jobs and good benefits that keep our communities strong. They supporting the shut down and don't do style of life, that kills opportunity for the future generations of this great state.

Sincerely,
Dennis R Davis
P O Box 438
Whitehall, Mont. 59759

Dennis R Davis

Response to Letter 75

Thank you for your letter. No response necessary.

Letter 76

December 12, 1997

Mr. Greg Hallsten
Dept. of Environmental Quality
Impact Assessment Bureau
P.O. Box 200901
Helena, Montana

Dear Mr. Hallsten:

This letter is to urge you to expedite the Environmental Impact Statement process for the expansion permit at Golden Sunlight Mine.

Having read the summary for draft EIS, I believe potential impacts and alternatives have been addressed. I'm comfortable that water resources such as the nearby Jefferson River will be safe because the water management plan required will protect water resources.

As a member of a local sportsmans club, I have had the opportunity to witness that Golden Sunlight clearly demonstrates a commitment to wildlife and habitat preservation. This is true not only at the present mine site, but also the surrounding area.

I urge you to issue a final EIS as quickly as possible. Further delays adds to undermine the viability of the operation in these uncertain times of low gold prices.

Sincerely,

Joseph M Dillon

Joseph M. Dillon

RECEIVED
DEC 15 1997
MT DEPT OF ENV QUALITY
PERMITTING & COMPLIANCE DIV

Response to Letter 76

Thank you for your letter. No response necessary.

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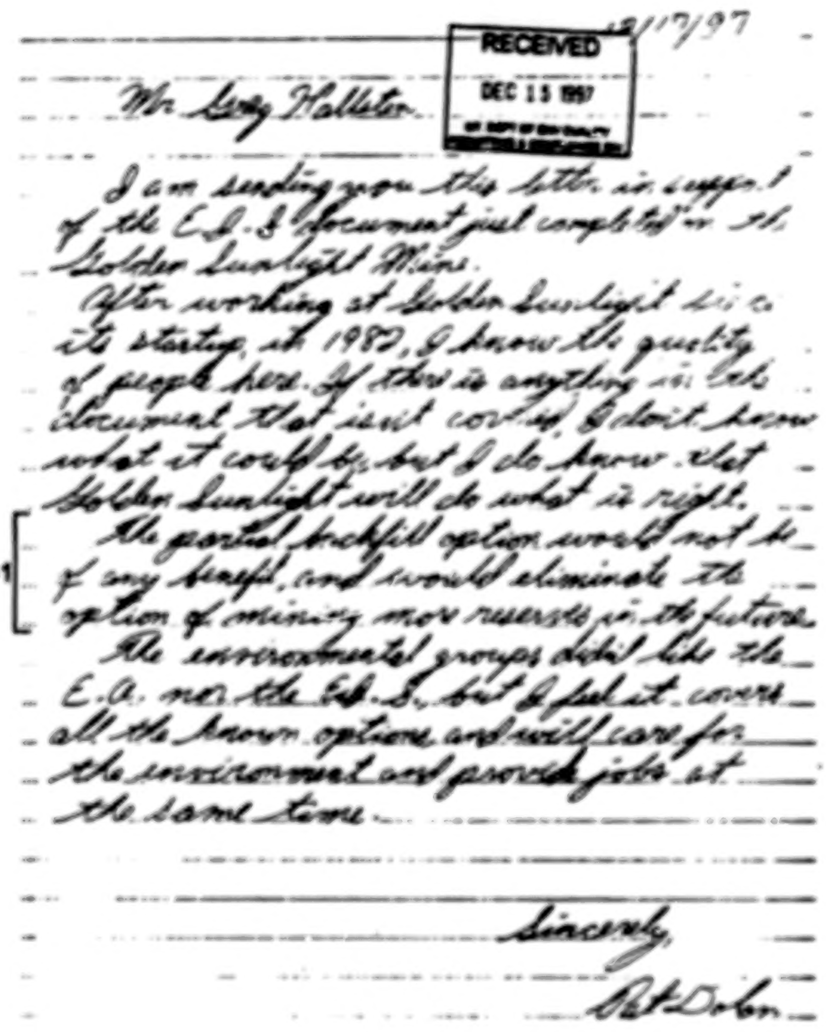
Letter 77



12/11/97

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DEC 15 1997

Mr Greg Hallsten

I am sending you this letter in support of the E.I.S. document just completed on the Golden Sunlight Mine.

After working at Golden Sunlight since its starting, in 1982, I know the quality of people here. If there is anything in this document that isn't covered, I don't know what it could be, but I do know that Golden Sunlight will do what is right.

77-1 The partial backfill option would not be of any benefit, and would eliminate the option of mining more reserves in the future.

The environmental groups didn't like the E.A. nor the E.I.S., but I feel it covers all the known options and will care for the environment and provide jobs at the same time.

Sincerely,

Pat Dolan

Response to Letter 77

77-1 Comment noted. Please see the Response to Comment 23-5.

Letter 78

RECEIVED
JAN 14 1998
[illegible]

January 10, 1998

Mr. Greg Hallsten
MDEQ
P.O. Box 200901
Helena, MT 59620-0901

Dear Mr. Hallsten:

I am writing you in support of issuing, soon, the Golden Sunlight Mine Operating Permit No. 00065.

By the size of the EIS document, I can't imagine anything being left out. This should easily be legally defensible.

78-1 The part of backfilling the pit and the MP-4 bird netting avoidance measure are ridiculous and appear to have been just put in to pacify the extreme environmentalists, who want to shut down mining in Montana.

I am certain Golden Sunlight Mine will comply with the U.S. Army Corps of Engineers 404 permit requirements.

After attending the public meeting on the EIS in Whitehall it should be quite obvious to all that Golden Sunlight Mine needs this permit soon.

Sincerely,
Don Drake

Don Drake
P.O. Box 255
Whitehall, MT 59759

Response to Letter 78

78-1 Comment noted. Please see the Responses to Comments 16-37, 23-2, and 23-5.

Letter 79

December 11, 1997

RE: Golden Sunlight Mines, Inc. draft EIS

REC
DEC 1
[illegible]

Mr. Greg Hallsten
Dept. of Environmental Quality
Impact Assessment Bureau
P. O. Box 200901
Helena, MT 59620

Dear Mr. Hallsten:

I am writing to you concerning Golden Sunlight Mines EIS draft documents. Sunlight's staff along with many specialized consultants have spent years looking forward into Sunlight's future, picking apart every possible alternative and ramification. I believe its time to bury the hatchet and let sunlight mine a mine.

I support Golden Sunlight's preferred alternative EIS plan, and I urge you to approve the final EIS as soon as possible.

Sincerely,

Devin R. Drayton

RECEIVED
DEC 18 1997
[illegible]

Response to Letter 79

Thank you for your letter. No response necessary.

Letter 80

Dear Mr. [illegible],

I fully support Golden Sunlight Mines proposed action in the E.I.S. recently released.

A common sense approach to mining and no pit backfilling and water management is necessary and appreciated.

Golden Sunlight and their parent company Placer Dome have an excellent record and I'm proud to work for them.

The attacks by certain Envir. groups are designed to destroy an industry and ruin my way of life.

Golden Sunlight represents 205 individuals and their families, we need to have this matter positively settled as soon as possible.

Thank You

RECEIVED
DEC 15 1997
[illegible]

Response to Letter 80

Thank you for your letter. No response necessary.

Letter 81

RECEIVED

JAN 0 5 1998

Leonard Dueck
P.O. Box 288
Whitehall, MT 59759

January 5, 1998

Montana Department of Environmental Quality
Impact Assessment Bureau
P.O. Box 200901
Helena, Montana 59620-0901
Attention: Mr. Greg Hallsten

Dear Mr. Hallsten:

I have lived in Whitehall for 9 years and I am a mechanic at Golden Sunlight Mine. In fact, my employment is what brought me to Whitehall. My wife, Sandy and I have one daughter. When I am not working 10 hour shifts at Sunlight, I spend most of my time building a new house for my family. One that I hope to live in for a good long time, providing I have the opportunity to even finish it. I enjoy hunting and golf, depending on the season. My wife and I have a lot of family here in town and my Dad spends every summer with us. I like living here and my wife and I really want to raise our daughter here. It is important to us to raise Bailey in a small, close-knit community, with some strong values and great people. We are not nameless statistics that would be affected by a premature mine closure or a lengthy delay in permitting. We are good members of our community and want the chance to continue to be a part of Whitehall. It is important to us for you to know that.

81-1 I have a concern with pages 27 and 28 of the Summary under the heading of Pit Reclamation Feasibility. Every word under this heading has to do with the economic feasibility of partially backfilling the pit at Sunlight. I think that is wrong. This is not just about money. This is also about what is safe for the environment. Because I want to raise my daughter here, that is a concern of mine. But when I read through other sections in this EIS, I find out that environmental concerns have been looked at and that partially backfilling the pit doesn't provide me or my family with any more environmental protection. The problem is, the Summary just doesn't talk about it.

If I didn't know anything about Golden Sunlight Mine or their reclamation plan and I was just someone on the street who wanted to know about our mine, I would want to know why there wasn't more to this section in the summary. I would want to know that my concern for the physical environment had been looked into. I know that it has because I have checked but someone else may not.

Response to Letter 81

81-1 Comment noted. Please see the Response to Comment 23-5.

Letter 81 Continued

By the way, this is pretty heavy reading and I suspect that most people don't get past the summary. I barely did.

81-1 I would like you to talk about why we are not sacrificing the environment by not backfilling the pit in addition to talking about the fact that there is no way Golden Sunlight could continue to operate if they were required to do so. That way, everyone would have the right information.

Thank you.

Leonard Dusch

Response to Letter 81

Letter 82

Mr. Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
P.O. Box 200901
Helena MT 59620-0901

Mr. Ralph Anderson
[illegible] E St
Whitehall MT 59759

Dear Mr. Hallsten

As an employee of Golden Sunlight Mine I am asking that the EIS be the same as the draft document as I feel it is a sound document.

I feel GSM has shown an excellent job on past reclamation and habitat preservation and have been a strong supporter of the community.

Sincerely
Ralph F. Anderson

RECEIVED
DEC 11 1997
[illegible]

Response to Letter 82

Thank you for your letter. No response necessary.

Letter 83

Dear Mr. Hallsten

I am writing you in support of Golden Sunlight Mine's Operating Permit No. 00065, which would allow continued and expanded operation of their mine in Whitehall, Montana.

The draft EIS appears to have been well prepared and provides a high level of technical analysis of the alternatives and environmental effects of This Proposal.

I believe that The Water Management Plan and Mixing Zone analysis have addressed ways to assure that Water Quality Standards are adhered to and protected.

I support Golden Sunlight's application for a 404 permit from the Corps of Engineers and believe The company has demonstrated a willingness to comply with all 404 Requirements.

Sincerely,

William [illegible]

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DEC 16 1997
[illegible]

Response to Letter 83

Thank you for your letter. No response necessary.

Letter 84

DEC 10TH 1997

MR. GREG HALLSTEN,
DEPT. OF ENVIRONMENTAL QUALITY,
HELENA, MONT.

RECEIVED
DEC 15 1997

DEAR MR HALLSTEN,

PLEASE ACCEPT THIS AS A LETTER OF SUPPORT FOR GOLDEN SUNLIGHTS OPERATING PERMIT #00065.

I BELIEVE GOLDEN SUNLIGHTS PAST PRACTICES DEMONSTRATE THEIR COMMITMENT TO THE ENVIRONMENT & COMMUNITY.

THE PROPERTY IN QUESTION ALREADY ABOUNDS WITH WILDLIFE & ADDITIONAL PROPERTIES HAVE BEEN PURCHASED FOR MANAGED WATER FOUL HABITAT.

GOLDEN SUNLIGHTS WATER TREATMENT PLAN SEEMS VERY WELL PLANNED & PROVIDES A LARGE SAFETY FACTOR TO PROTECT WATER RESOURCES.

84-1 I DO NOT BELIEVE THE PARTIAL PIT BACK FILL CLAUSE SHOULD EVEN BE CONSIDERED AS NO ONE OR ANY THING WOULD BENEFIT.

PLEASE EXPEDITE YOUR DECISION ON THE E.I.S. & ISSUE THE R.O.D. AS QUICKLY AS POSSIBLE.

RESPECTFULLY
Dale Easton

219

Response to Letter 84

84-1 Comment noted. Please see the Response to Comment 23-5.

Letter 85

William G. Faust Jr.
[illegible] Conroy Lane
Whitehall, MT 59759
Home Phone 406 287-[illegible]

RECEIVED
JAN 12 1998
MT. DEPT OF ENV QUALITY
[illegible]

January 09, 1998

Montana Department of Environmental Quality
Impact Assessment Bureau
Attn: Greg Hallsten
Box 200901
Helena, MT 59620-0901

Sir,

I am writing this in conjunction with a news article I recently read in the Montana Standard concerning the adequacy and accuracy of the DEIS for the expansion of the Golden Sunlight Mine in Whitehall, Montana.

Although I am not familiar with the specific issues, I would like to state that I do not believe that the DEIS should be pushed through nor should any part of it be disregarded just so that the mine can continue to operate uninterrupted by the very laws and regulations that were put in place to protect both the communities in the area as well as the environment. I do believe that the mine is owed a timely, but thorough, DEIS.

As a resident of the Whitehall area, I do believe that the Golden Sunlight Mine has been an extremely conscientious neighbor, and has contributed greatly to the community. I do not believe that this should allow them the granting of a relaxing of any regulations. I understand that one issue may be the one of reclamation. If the mine received an initial permit with the understanding that reclamation would be necessary, by all means, do not issue an expansion permit until they guarantee reclamation. If the expansion is dependent upon reclamation, I also believe that the permit should be denied until they agree. The price of mining minerals should taken into account by the mining companies when they decide to extract those minerals. I do not see where this should create financial problems for the community, as many of the people hired to extract the minerals will be needed once mining is concluded to reclaim the pit.

Sincerely,

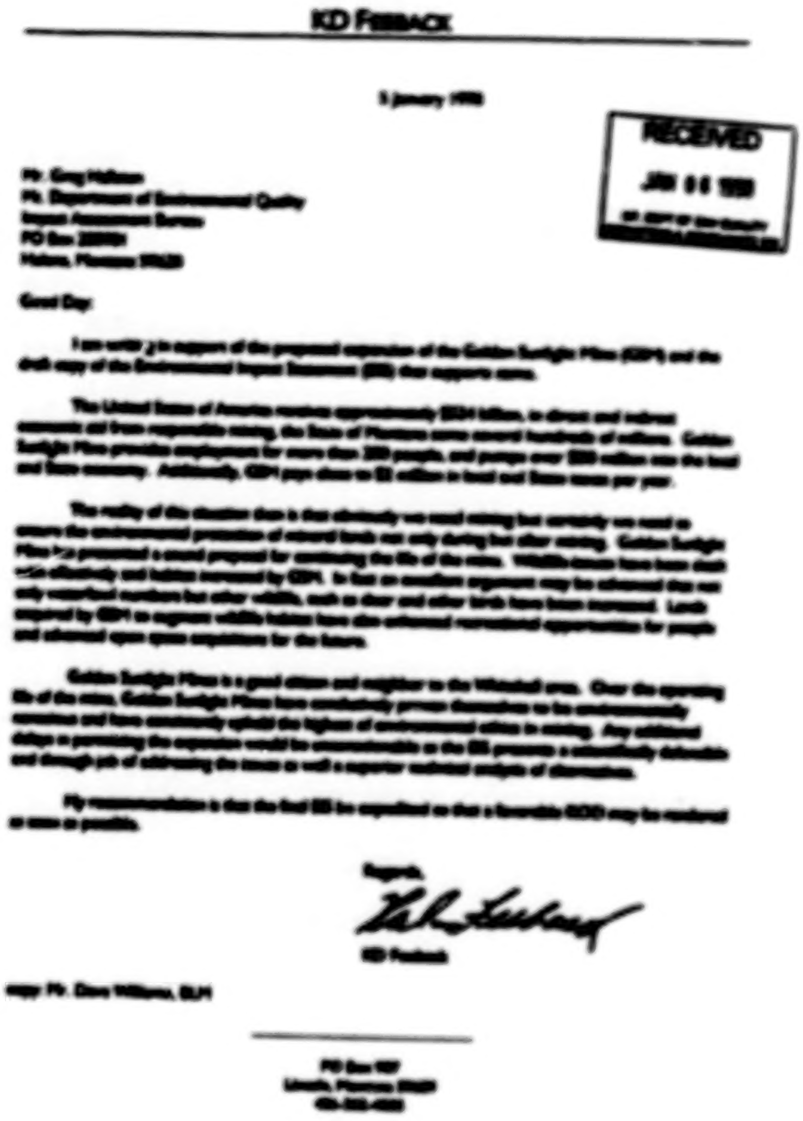
William G. Faust

William G. Faust

Response to Letter 85

Thank you for your letter. No response necessary.

Letter 86



RECEIVED

Good Day:

221

Response to Letter 86

Thank you for your letter. No response necessary.

Letter 87

12-11-97

Mr Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
P.O Box 200901
Helena, Montana 59620-

RECEIVED
DEC 15 1997

Dear Mr Hallsten

I am writing To support Golden Sunlight Mine's Proposed Action in the Draft Environmental Impact Statement That was recently submitted for Public opinion

The Draft EIS is a Thorough Document That has Taken a lot of Time to put Togeather, + which includes a comprehensive water management plan To protect water resources.

I urge you to expedite The EIS Process and To issue a final EIS as quickly as possible. The Golden Sunlight mine supports 205 Families directly and generates another 21 million in economic activity in surrounding Communities. We are Tired of The Delays in this process and are satisfied all concerns have been adressed.

Sincerely Cindy

Response to Letter 87

Thank you for your letter. No response necessary.

Letter 88

[illegible]

RECEIVED

[illegible]

[illegible]

[illegible]

88-1 [illegible]

[illegible]

[illegible]

88-2 [illegible]

223

Response to Letter 88

88-1 Comment noted. ARD concerns under the Partial Backfill Alternative are discussed in Section IV.B.7. Please see the Responses to Comments 16-37 and 23-5.

88-2 Comment noted. Please see the Response to Comment 23-2.

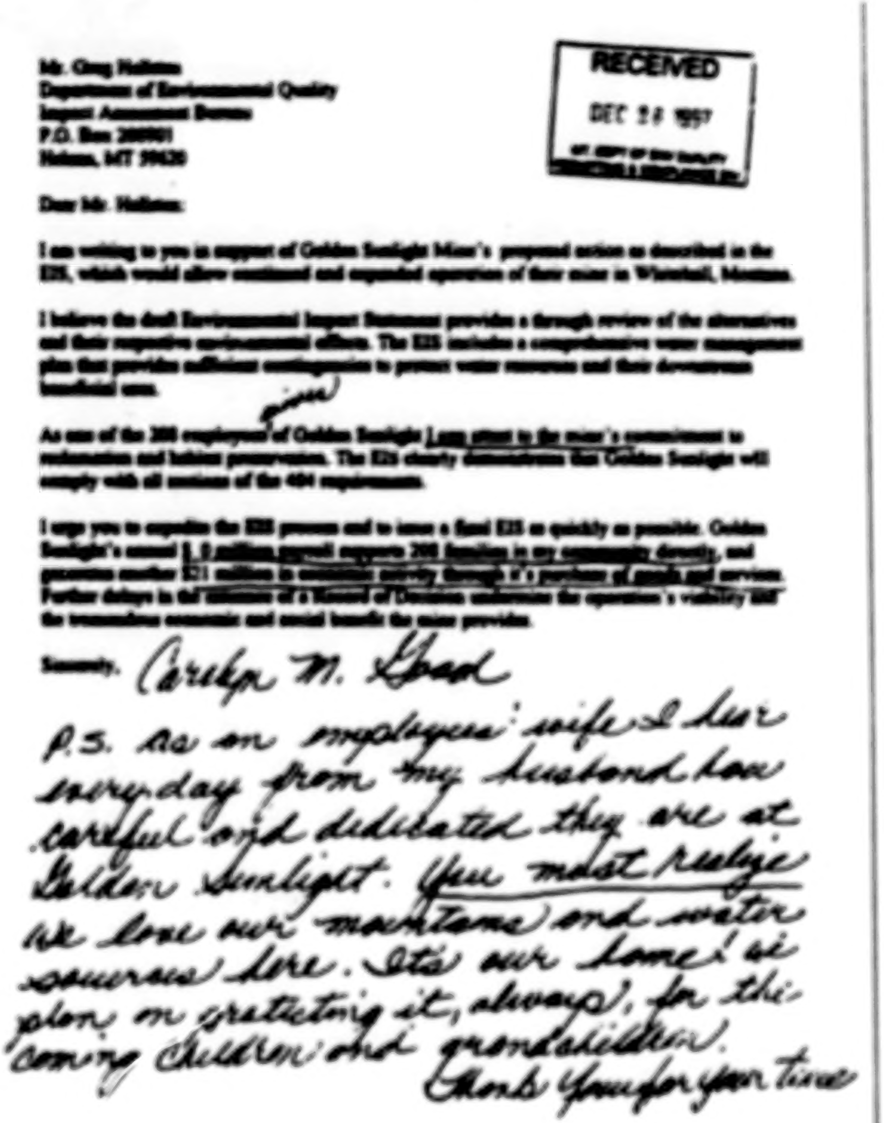
Letter 88 Continued

[illegible]

[illegible]

Response to Letter 88

Letter 89



RECEIVED
DEC 24 1997

Mr. Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
P.O. Box 200901
Helena, MT 59620

Dear Mr. Hallsten:

I am writing to you in support of Golden Sunlight Mine's proposed action as described in the EIS, which would allow continued and expanded operation of their mine in Whitehall, Montana.

I believe the draft Environmental Impact Statement provides a thorough review of the alternatives and their respective environmental effects. The EIS includes a comprehensive water management plan that provides sufficient contingencies to protect water resources and their downstream beneficial uses.

As one of the 200 employees of Golden Sunlight I can attest to the mine's commitment to reclamation and habitat preservation. The EIS clearly demonstrates that Golden Sunlight will comply with all sections of the 404 requirements.

I urge you to expedite the EIS process and to issue a final EIS as quickly as possible. Golden Sunlight's annual $ 8 million payroll supports 200 families in my community directly, and generates another $21 million in economic activity through it's purchase of goods and services. Further delays in the issuance of a Record of Decision undermines the operation's viability and the tremendous economic and social benefit the mine provides.

Sincerely, Carolyn M. Good

P.S. As an employees' wife I hear everyday from my husband how careful and dedicated they are at Golden Sunlight. You must realize we love our mountains and water sources here. It's our home! (& plan on protecting it, always), for the coming children and grandchildren.
Thank You for your time

Response to Letter 89

Thank you for your letter. No response necessary.

Letter 90

11 Dec 1997

Mr. Greg Hallsten
DEQ
PO Box 200901
Helena MT. 59620-09021

Page 1 of 2.

RECEIVED
DEC 18 1997

Dear Mr. Hallsten,

I am writing you in support of Golden Sunlight Mines Proposed Action, found in the recently released Draft Environmental Impact Statement that reviews a proposed expansion of their mine in Whitehall MT.

The Draft EIS does a thorough job & provides a high level of technical analysis of alternatives & environmental effects.

GSM's water management plan is very detailed and provides more than a better factor of safety needed to protect water resources, including mixing zone to protect downstream water users.

90-1 Mitigation Measure WF-4 to protect bird nesting habitat by "avoidance" from May to July is unrealistic as GSM has supplied several thousand surrounding acres to provide wildlife habitat.

90-2 The Partial Pit Backfill Alternative should not be considered. It will not help the water situation at all - nor improve wildlife habitat or air quality.

Response to Letter 90

90-1 Comment noted. Please see the Response to Comment 23-2.

90-2 Comment noted. Please see the Response to Comment 23-5.

Letter 90 Continued

page 2

90-2 Most important it is very cost prohibitive.

Delays in EIS process have & will continue to negatively impact GSM's operation. I would ask you to urge DEQ & BLM to expedite the Final EIS and issue the ROD as quickly as possible. The Draft EIS should be incorporated as it is into the Final EIS.

As everyone knows the shut down of a major employer like the Golden Sunlight mine has a very large financial & emotional impact on everyone, in the area. Therefore as an area farmer and member of the Jefferson Valley Conservation District board I would ask your support of the Draft, as I believe it answers all challenges to water & air quality as well as wildlife habitat. It does this with sound technical data that will work and not a "I think it will".

Yours truly

Mark Gornick
56 Gornick Lane
Whitehall Mt
59759

Response to Letter 90

Letter 91

RECEIVED

JAN 05 1998

Mark Gurnick
36 Gurnick Lane
Whitehall, MT 59759

January 5, 1998

Montana Department of Environmental Quality
Impact Assessment Bureau
P.O. Box 200901
Helena, MT 59620-0901

RE: Golden Sunlight Mine EIS

Dear Mr. Hallsten:

I have been employed by GSM for almost 5 years as an equipment operator. I am married and have 3 grown daughters and 3 grandchildren. I am very fortunate since all three of my daughters and their families continue to live in Montana. Many other fathers are not that lucky. In fact, one of my daughters is employed by Montana Tunnels Mine. In between working 12 hour shifts at Golden Sunlight, I try to keep my 300 acre farm going while running 40 head of purebred cows. I hunt, fish, and enjoy going to and watching a high school ball game. I have been living at the same address now for almost 50 years and enjoy visiting with the neighbors and playing pinochle. I know this isn't information that is included in the EIS but it is important because when we are talking about the Golden Sunlight Mine, we are also talking about our community and its important to know who makes up our community. I am one of the members of this community and I don't choose to be faceless.

91-1 I completely agree with the Montana Department of Environmental Quality in their dismissal of the partial pit backfill alternative. I also agree that the cost of partially backfilling the pit is unwarranted when compared to almost non-existent environmental benefits. However, I would like you to consider adding to the language that is contained in the summary dismissal of the partial backfill alternative. I think there needs to be more of a discussion about the requirements of the Metal Mine Reclamation Act in the summary.

One of the requirements of the Metal Mine Reclamation Act is that *in the case of open pits and rock faces, the reclamation plan must provide for reclamation to a condition, according to subsection (b) that affords utility to humans and the surrounding natural system to the extent feasible.*

228

Response to Letter 91

91-1 Comment noted. Please see the Responses to Comments 16-37 and 23-5.

Letter 91 Continued

91-1 Two issues were identified during the scoping concerning the loss of potential bat habitat and loss of raptor nesting habitat. These concerns have been adequately analyzed. Golden Sunlight's reclamation plan and the agency preferred alternative for not having a pit pond, satisfy address these concerns while complying with the requirements of the Metal Mine Reclamation Act to afford utility to the surrounding natural spaces.

I would like to see this aspect highlighted in the summary discussion for not choosing the partial pit backfill alternative.

I would also like to emphasize my support for Golden Sunlight Mine's continued operation. My job is important to me and my family. But ultimately, it is important to Jefferson County and to Montana. I hope that you consider it accordingly.

Best regards,

Mark [illegible]

Mark [illegible]

Response to Letter 91

Letter 92

Mr. Greg Hallsten
Department of Environmental Quality
Environmental Assessment Bureau
P.O. Box 200901
Helena, Montana 59620-0901

RECEIVED
DEC 16 1997

Dear Mr. Hallsten

I am writing to you to express my support of the Golden Sunlight mining proposed Draft Environmental Impact Study that recently released from your Department.

92-1 The backfilling of the pit in my opinion would be the wrong thing to do because it will make it harder to handle the water that comes from that pit.

Without this permit and the mine there will be a loss of 300 jobs to the community and State, a loss of great tax and wages generated. I have worked at several mines in the state and every one has cleaned up the site better than it was left by previous mining activity before there was Governmental departments to monitor these sites.

I support Golden Sunlight water management plan it is very detailed and thorough. this permit has been in the [illegible] process for almost 7 years. [illegible] I do not think any more delays are necessary. Golden Sunlight is a business they cannot operate in the red any more any one [illegible]

Regards

Alan E. Gray
Mill Superintendent
Golden Sunlight Mine

Response to Letter 92

92-1 Comment noted. Impacts to water resources under the Partial Backfill Alternative are discussed in Section IV.B.7. See also the Response to Comment 23-5.

Letter 93

Dec 11, 1997

Mr. Greg Hallsten
Dept of Environmental Quality
Impact Assessment Bureau
P.O. Box 200901
Helena, MT. 59620

RECEIVED
DEC 1[illegible] 97

Dear Mr. Hallsten

I am sending this short letter to you to voice my support of Golden Sunlight Mines effort to obtain Operating Permit # 00065. After reviewing the mines draft EIS it is clear to me that the mine is trying to please all involved, while still trying to operate in such a way as to keep Montanans gainfully employed.

Sir, Golden Sunlight has proven time and time again that they strive to operate in a fashion that minimizes disturbance to the land realizing it will be returned to its natural state (perhaps only a little better than originally) when operations cease.

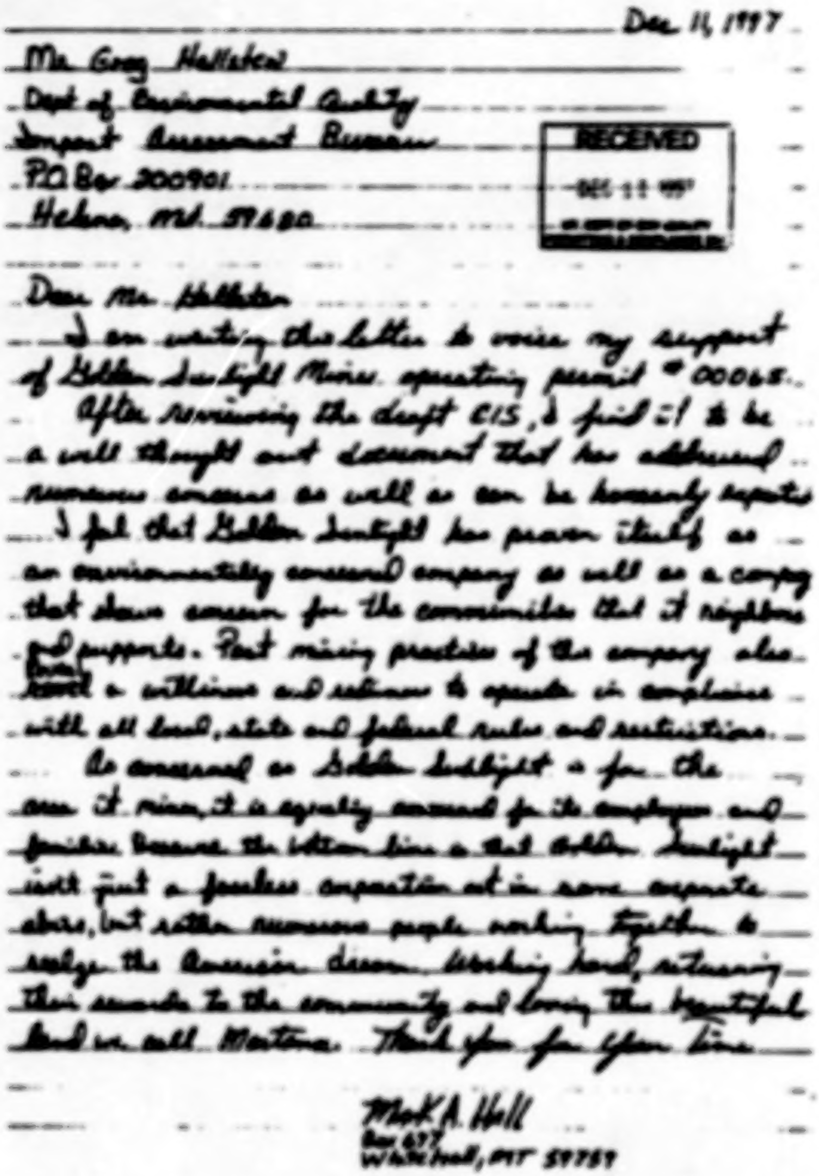
Mr Hallsten, I do not know if you have met many of the people who work at the mine, but I have and I know that all these people have a reverence for this land we all have and not one of them would any harm to come to this land. These folks do not want to get the money and get out to another mine, this is their home and they are very aware of the privilege of being able to work and live in their home. I urge you to assist in finalizing the EIS and render a favorable ROD to Golden Sunlight. The land and the people of Montana are depending on you.

Thank You
[illegible]
Box 177
Whitehall, MT 59759

Response to Letter 93

Thank you for your letter. No response necessary.

Letter 94



Dec 11, 1997

Mr Greg Hallsten
Dept of Environmental Quality
Impact Assessment Bureau
P.O. Box 200901
Helena, MT 59620

RECEIVED
DEC 12 1997

Dear Mr. Hallsten

I am writing this letter to voice my support of Golden Sunlight Mines operating permit # 00065.

After reviewing the draft EIS, I find it to be a well thought out document that has addressed numerous concerns as well as can be humanly expected.

I feel that Golden Sunlight has proven itself as an environmentally concerned company as well as a company that shows concern for the communities that it neighbors and supports. Past mining practices of the company also have shown a willingness and [illegible] to operate in compliance with all local, state and federal rules and restrictions.

As concerned as Golden Sunlight is for the area it mines, it is equally concerned for its employees and families. Because the bottom line is that Golden Sunlight isn't just a faceless corporation out in some corporate abyss, but rather numerous people working together to realize the American dream. Working hard, returning their rewards to the community and loving this beautiful land we call Montana. Thank you for your time

Mark A. Hall
Box 677
Whitehall, MT 59759

Response to Letter 94

Thank you for your letter. No response necessary.

Letter 95

JERRY D. HANLEY
120 12th AVE. SO.
LEWISTOWN, MONTANA 59457
(406) 538-2420

January 5, 1998

RECEIVED
JAN 13 1998
[illegible]

Mr. Dave Williams
BLM, Butte District
Headwaters Resource Area
PO Box 59702
Butte, MT 59702

Mr. Greg Hallsten
DEQ
Impact Assessment Bureau
PO Box 200901
Helena, MT 59620

Dear Sirs:

Twenty years ago I worked underground at the Golden Sunlight Mine; the pit has now mined through those old exploration workings and once again it's time for Golden Sunlight to expand operations. I support the mine's past, present and hopefully future, operations at Whitehall, Montana.

The draft EIS, in conjunction with Operating Permit No. 00065, thoroughly addresses the effects of the proposed expansion and the various alternatives involved. It is obvious that a great deal of thought and consideration went into this EIS. I compliment not only Golden Sunlight Mine (GSM), but also your agencies for their input.

95-1 Regarding the WT-4 bird nesting mitigation measures, Golden Sunlight has already implemented steps to provide alternative bird habitat. To require GSM to suspend operations for something they have already mitigated is not necessary or reasonable. GSM has provided habitat not only for birds, but other species as well, please don't penalize GSM for their efforts by implementing the suspension-for-nesting alternative.

The water quality and water resources issues are quite detailed in the EIS and insure that adequate protections are spelled out for both. Similarly, I support Golden Sunlight's position regarding the 404 permit. Their plan to divert storm waters around the fill appears to be well engineered and would have no detrimental effects.

95-2 Pit-backfill is an issue that concerns me. Backfilling at the Golden Sunlight would add little, if any, environmental benefit, but would prevent additional resources (400,000 ounces of gold is on the table at present!) from being mined. What would be the purpose of requiring such a costly operation (backfilling would be very expensive, regardless of

Response to Letter 95

95-1 Comment noted. Please see the Response to Comment 23-2.

95-2 Comment noted. Please see the Responses to Comments 16-37 and 23-5.

Letter 95 Continued

95-2 the last concern) when the environmental benefits are insignificant. Additionally, Montana law does not require backfilling; therefore I do not understand why it is even an issue in this EIS.

The economic and social benefits (not only for the more than 200 employees, but also the schools, local and state governments, suppliers and many, many more) that is provided by the mine, is presented in the EIS. However, I do not feel you have placed enough emphasis on it and this huge benefit cannot be ignored or made light of.

Golden Sunlight has always been a leader in good and minerlike operations and is equally responsible and committed when it comes to protecting and enhancing the environment and community. Further delays or denials in this EIS application and process can only have a negative impact for all. I am impressed with the resilience Golden Sunlight has shown in spite of the excessive delays already caused by this EIS.

Please move as quickly as possible with the final EIS and issue a decision as quickly as possible. Please consider my concerns and comments in that decision.

Sincerely,

Jerry Hanley

Response to Letter 95

Letter 96

date January 11, 1998

To Mr Greg Hallsten
Dept. of Environmental Quality
Project Assessment Bureau
PO Box 200901
Helena MT 59620

RECEIVED
JAN 14 1998

From [redacted]

Re EIS - Golden Sunlight

Dear Mr Hallsten

I am sure you are aware of all the facts concerning GSM. It is a mine that should be allowed to continue running as scheduled. with all of the states reclamation laws, water laws, mining laws etc. The mine is asset to the state.

One must remember that we are a natural resource state & that mining, logging & ranching can account & is what our state should be proud of. I am an outdoors person - I hunt, fish, hike, ski, camp, boat - and also am a miner. I love the natural resources we have but cannot eat scenery.

Thanks for your time

PS Yes - there are both sides to the mining issue - I've seen both sides of views of ranchers, miners, loggers, hunters, hikers. I love the outdoors but am not a radical environmentalist.

Response to Letter 96

Thank you for your letter. No response necessary.

Letter 97

Montana Department of Environmental Quality
Impact Assessment Bureau
Box 200901
Helena, MT 59620
Attn: Greg Hallsten

November 23, 1997

Dear Sir,

97-1 I am writing you concerning the proposed expansion of the Golden Sunlight mine, near Whitehall. As a resident of Butte I am acutely aware of what an open pit mine can do to an area. I was born in Montana, and was in college when the Golden Sunlight mine began. Each year since I have watch the tailing piles grow, and I must say it has been very disturbing to me. Now the proposed expansion, I am not against jobs and development, but the very best reclamation has to be part of the plan. If the costs of the best reclamation plan are too great, then the value of gold is too low. In this case it seems reasonable to delay expansion until such time that the price of gold will justify the development and satisfactory reclamation. The Jefferson watershed is more valuable to Montana and it future than any mineral development, it absolutely has to be maintained or enhanced

Sincerely,

Mark Hood
2411 Elizabeth Warren
Butte, MT 59701

Response to Letter 97

97-1 Comment noted. Please see the Response to Comment 2-11.

Letter 98

Montana Department of Environmental Quality
Bureau of Impact Assessment
Box 200901
Helena, MT 59620-0901
Attn: Greg Hallsten

RECEIVED
JAN 21 1998
[illegible]

January 15, 1998

Dear Mr. Hallsten,

I am writing in response to a news paper article I read in the January 7, 1998 issue of the Montana Standard. The article dealt with the backfill debate centered around the Golden Sunlight mine.

I was struck by a number of comments in the article. I think the comments regarding the economic effects of backfilling on the existing and/or future mining activities in Montana are moot. The real issue should be the very best reclamation methodology. The Montana Department of Environmental Quality should be focused on how to best mitigate the adverse environmental consequences of an open pit mine. If the best mitigation option includes backfilling all or a portion of the mine, then so be it.

98-1 With the recent events concerning gold, it price, commodity status and the bankruptcy of the Pegasus mine, it brings into question the short term viability of all gold ventures in Montana. Another good reason to insure they are held accountable for the adverse environmental effects of mining.

As a second generation Montanan, raising a family in Butte, I am painfully aware of the mining legacy in Montana. I sympathize with those miners who will lose their job when the Golden Sunlight mine closes, (I have been laid off before) but they must have known that mining is not a sustainable venture.

In closing, I strongly believe that your Department must choose the very best reclamation plan, regardless of its effect on the Golden Sunlight mine, or any other mine

Thank you for your consideration,

Mark [illegible]
2911 Elizabeth Warren
Butte, MT 59701

Response to Letter 98

98-1 Comment noted. Please see the Responses to Comments 2-11 and 16-37.

Letter 99

RECEIVED
DEC 22 1997

December 18, 1997

Mr. Greg Hallsten
Dept of Environmental Quality
Impact Assessment Bureau
P.O. Box 200901
Helena, Montana 59620

Dear Mr. Hallsten:

I am an employee of the Golden Sunlight Mine near Whitehall, Mt. Recently I received copies of the Draft EIS. I find it a responsible, intelligently compiled, scientific document. I am sure you would agree there are answers to any and all questions about where and how the Golden Sunlight will perform their future mining ventures. They are environmentally sound answers.

We need mining in our society. I believe certain folks who are against mining do not understand the importance and complexity involved in making their daily lives the best in the world. Mining plays a huge part in everyday life providing raw metals for a thousand gadgets and machines we all use and rely on.

Response to Letter 99

Thank you for your letter. No response necessary.

Letter 99 Continued

- 2 -

Please be open-minded in your personal review of the Golden Sunlight's E.I.S, and mining in general. It is important that G.S.M. continues its present operation as the positive, environmentally safe industry, we have known to exist and benefit from during the past 15 or so years.

Thank-you very much for your time

Sincerely Yours,

30 Pam Gulch RD
Whitehall, MT. 59759

30 Pam Gulch Rd
Whitehall, MT. 59759

Response to Letter 99

Letter 100

RECEIVED
JAN 06 1998
[illegible]

11 Davis Road
Whitehall, Montana 59759
January 1, 1998

Mr. Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
PO Box 200901
Helena, Montana 59620

Dear Mr. Hallsten:

I support Golden Sunlight Mines Environmental Impact Statement Draft. As a Montana native and mine employee, GSM provides not only a way to make a living but also allows me to live in an area where I can enjoy the outdoors.

As in the past, I believe GSM will continue to comply with all the numerous state and federal government's environmental laws. The draft EIS thoroughly addresses and answers all the environmental effects GSM's continued mining operation will have on air quality, water quality, and wildlife habitat.

In assessing GSM's EIS draft, please consider their past and current reclamation practices. GSM's reclamation practices are very positive.

Sincerely,

Lance Hagquist

Lance Hagquist

Response to Letter 100

Thank you for your letter. No response necessary.

Letter 101

Mr. Greg Hallsten
Department of Environmental Quality
Project Assessment Bureau
P.O. Box 200901
Helena, Montana 59620

First of all I would like to state that Golden Sunlight Mine has been the best thing that has happened in southwest Montana in a long time and at this time we need your support in keeping this mine in operation.

I work for Vigilante Electric Coop and they have been great for us to work with.

Golden Sunlight needs your help in seeing that this permit No. 00065 is approved and as quickly as possible.

Thanks for your support,
William [illegible]
11 Davis Rd.
Whitehall, MT 59759

RECEIVED
DEC 15 1997

Response to Letter 101

Thank you for your letter. No response necessary.

Letter 102

12/11/97

Mr. Greg Hallsten
Department of
Environmental
Quality
Impact Assessment
Bureau
P.O.Box 200901
Helena MT. 59620

RECEIVED
DEC 15 1997

Dear Mr. Hallsten

I am writting you in support of the Golden Sunlight Mine's Operating Permit No. 00065, which would allow continued + expanded operation of the mine in Whitehall, Montana.

I am a 7th grader in Whitehall. My dad + Most of the dads + moms [redacted] in the town work at the mine. The Golden SunLight Mine supports our sports + our School. the mine accounts a substantial portion of the taxable value of local school districts.

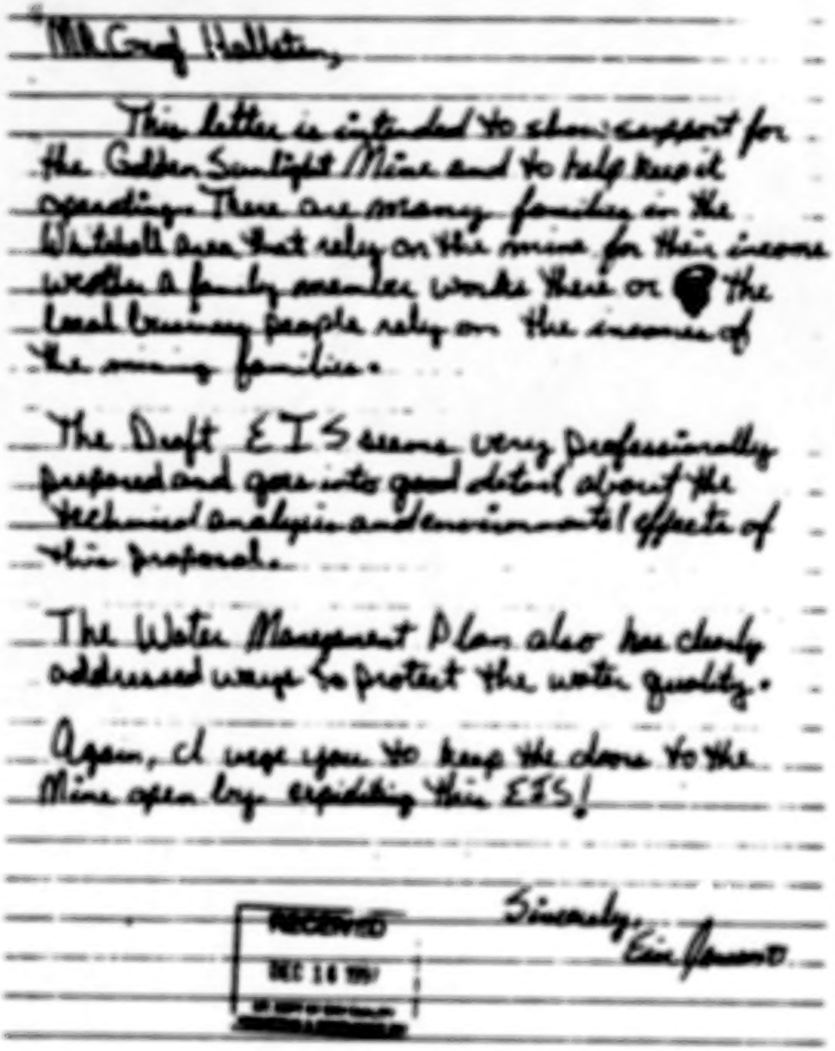
Golden Sunlight has operated in a responsible manner and utilizes it's resources to develop public access, establish training facilities + provide animal habitat. I believe that

Page 1

Response to Letter 102

Thank you for your letter. No response necessary.

Letter 103



Mr Graf Hallston,

This letter is intended to show support for the Golden Sunlight Mine and to help keep it operating. There are many families in the Whitehall area that rely on the mine for their income whether a family member works there or [illegible] the local business people rely on the income of the mining families.

The Draft EIS seems very professionally prepared and goes into good detail about the technical analysis and environmental effects of this proposal.

The Water Management Plan also has clearly addressed ways to protect the water quality.

Again, I urge you to keep the doors to the Mine open by expediting this EIS!

Sincerely,
Eric

RECEIVED
DEC 14 1997

Response to Letter 103

Thank you for your letter. No response necessary.

Letter 104

RECEIVED
DEC 16 1997

SAMPLE LETTER

Mr. Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
P.O. Box 200901
Helena, Montana 59620-0901

Mr. Dave Williams
BLM – Butte District
Headwaters Resource Area
P.O. Box 3388
Butte, Montana 59702

Dear Mr. Hallsten/Dear Mr. Williams:

I am writing to you in support of Golden Sunlight Mine's Proposed Action, found in the recently released Draft Environmental Impact Statement that reviews a proposed expansion of their mine in Whitehall, Montana.

I believe the Draft EIS provides a thorough review of the alternatives and their respective environmental effects. The EIS includes a comprehensive water management plan that provides sufficient contingencies to protect water resources and their downstream beneficial uses. Further, Appendix N also provides a good analysis that shows how Golden Sunlight will comply with Section 404 requirements.

I urge you to expedite the EIS process and to issue a final EIS as quickly as possible. Golden Sunlight's annual $10 million payroll supports 205 families in my community directly, and generates another $21 million in economic activity through the purchase of goods and services. Further delays in the issuance of a Record of Decision undermine the operation's viability and the tremendous economic and social benefits the mine provides.

Sincerely,

Response to Letter 104

Thank you for your letter. No response necessary.

Letter 105

Mr Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
P.O. Box 200901
Helena Montana 59620-0901

Mr Dave Williams
BLM - Butte District
Headwaters Resource Area
P.O. Box 39702
Butte Montana 59702

RECEIVED
DEC 11 1997
[illegible]

Dear Mr. Hallsten / Dear Mr. Williams

I am writing to you in support of Golden Sunlight Mine's Proposed Action found in the recently released Draft Environmental Impact Statement that reviews a proposed expansion of their mine in Whitehall, Montana.

I believe the draft EIS provides a thorough review of the alternatives and their respective environmental effects. The EIS includes a comprehensive water management plan that provides sufficient contingencies to protect water resources and their function

Response to Letter 105

Thank you for your letter. No response necessary.

Letter 105 Continued

landfill area. Further, Appendix N also provides a good analysis that shows how Golden Sunlight will comply with Section 404 requirements.

I urge you to expedite the EIS process and to issue a final EIS as quickly as possible. Golden Sunlight's annual $10 million payroll supports 205 families in my community directly, and generates another $21 million in economic activity through the purchase of goods and services. Further delays in the issuance of a Record of Decision endanger the operation's viability and the tremendous economic and social benefits the mine provides.

Sincerely,

Calvin [illegible]

Response to Letter 105

Letter 106

RECEIVED

JAN 05 1999

Calvin Johnson
170 McKeown Lane
Cardwell, MT 59721

January 5, 1999

Montana Department of Environmental Quality
Impact Assessment Bureau
P.O. Box 200901
Helena, MT 59620-0901
Attention: Mr. Greg Hallsten

Dear Mr. Hallsten:

I live in Cardwell and work in mill maintenance at Golden Sunlight Mine. My wife, Michelle is the kindergarten teacher at Cardwell School and we have one son who is 18 months old. Both my wife and I are native Montanans and we want to continue to live and work here. When I am not working or spending time with my family, I am raising cattle, team roping, hunting, fishing or doing whatever I can outside. Before I talk about the EIS specifically, I want to urge you to do everything within your power to make sure that this EIS process is completed before time runs out for Golden Sunlight and I face the very real possibility of losing my job. My son likes to eat!

106-1 Beginning on page 109 of the Draft EIS and continuing through page 114, there are charts that are a Summary Comparison of Resource Impacts Under the Proposed Action and Alternatives. By the way, there is no page number on page 113. These charts are pretty informative, particularly when looking at the Partial Backfill Alternative. Beginning on page 109, I'd like to run down the list.

Geology and Minerals	Same as for the Proposed Action
Paleontology	Same as for the Proposed Action
Water Resources-Water Quality	Same as for the Proposed Action
Water Resources-Water Quantity	Impacts would be the same as the Proposed Action because the pit water elevations would need to be maintained below the 5,050 foot elevation to protect groundwater.
Soils	Same as for the Proposed Action
Reclamation	Same as for the Proposed Action with an additional 235 acres revegetated.
Vegetation	Same disturbance acreage as the Proposed Action. An additional 235 acres of disturbance would be revegetated, leaving only 24 acres not revegetated.

Response to Letter 106

106-1 Comment noted. The page number was inadvertently omitted.

Letter 106 Continued

Regulatory Restrictions Analysis	Very restrictive. Additional expenditures of approximately $32,300,000 would be required. The economic feasibility is currently being evaluated.

106-2 So in the end, the partial backfilling alternative produces no impacts to 11 of these categories, produces more air emissions, requires the use of 10 million gallons of diesel fuel, which I found on page 394, and increases noise during reclamation. It may provide further employment but that is highly questionable if Golden Sunlight Mine calls it quits because of the high cost associated with backfilling and NO ONE is working. Benefits to bats and birds by not coming into contact with pit water is kind of a moot point since you have chosen the no pit pond alternative as your preferred alternative and the visual impacts would be slightly lower. It seems to me that the biggest benefit is 235 acres of revegetated land at a cost of $32,300,000 which comes out to $139,297.87 per acre. If I paid that much for grass, I know one thing, my cows wouldn't eat.

This is made even more moot by the fact that Golden Sunlight has already gone above and beyond their legal requirements and have more than offset these 235 acres with 5100 acres of land on the Candlestick Ranch, 531 acres in the Piedmont Swamps and 640 acres in the Bull Mountains. There is also approximately 4300 acres of land where the mine site is located, most of which will be reclaimed with native grasses and shrubs.

Frankly, I can find no reason to partially backfill this pit and I'm glad that you agree with me.

Sincerely yours,

Calvin W. Johnson

Calvin Johnson

Response to Letter 106

106-2 Comment noted. Please see the Responses to Comments 16-37 and 23-5.

Letter 107

Larry M. Johnson
P.O. Box 4204
Missoula, MT 59806

January 5, 1998

RECEIVED
JAN 08 1998
[illegible]

Mr. Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
P.O. Box 200901
Helena, Montana 59620

Dear Mr. Hallsten:

I am writing you in support of Golden Sunlight Mine's Operating Permit No. 00065, which would allow continued and expanded operation of their mine near Whitehall, MT.

The Golden Sunlight Mine has carried out their operations responsibly and shown exemplary initiative for developing new techniques for reclamation and environmental protection. Their pioneering work in steep-slope reclamation is but one example of their commitment to responsible mining practices.

I believe that the draft EIS has done a thorough job of analyzing the alternatives and that mitigation measures, as proposed by Golden Sunlight Mines, are sufficient for protecting the environment. 107-1 I also believe that Mitigation Measure WF-4 is unnecessary. Golden Sunlight Mine has already taken steps to provide ample habitat for birds and other wildlife. Requiring an operation to suspend work for one-quarter of the year is unrealistic and would put the operation in jeopardy.

Golden Sunlight Mine is the type of natural resource business that the State of Montana needs. To prolong the EIS process any longer than absolutely necessary would send a signal to potential new businesses in the State that we don't want them here. This would be a terrible mistake. To this end I request that the EIS be finalized and a ROD made as soon as possible. Delays in this process have already impacted the Mine's operations, and will continue to negatively impact operations until a decision is made.

Sincerely,

Larry M. Johnson

Larry M. Johnson

cc Mr. Dave Williams

Response to Letter 107

107-1 Comment noted. Please see the Response to Comment 23-2.

Letter 108

RECEIVED

JAN 0 5 1998

Mr. Martin L. Johnson
P.O. Box 634
Whitehall, MT 59759

January 5, 1998

Mr. Greg Hallsten
Montana Department of Environmental Quality
Impact Assessment Bureau
P.O. Box 200901
Helena, Montana 59620-0901

Dear Mr. Hallsten:

I've been employed by Golden Sunlight Mines since 1986 as an electrician. I'm married and have two kids, one boy and one girl. I enjoy my family, hunting, fishing, camping and just about any sport. I am actively involved in my community. I have coached Little Guy Wrestling, Little League Baseball, helped build the school playground, cleaned up the highways and I contribute what I can financially to any local group that comes knocking. I was also the driving force behind the formation of CURE in 1992.

Unfortunately, I know more than I care to about the history leading up to this EIS. I have spent countless hours writing letters, talking to everyone I can about Golden Sunlight Mines and its permitting nightmare, testifying before the Legislature, sitting in the courtroom during the legal proceedings and worrying myself sick. I want this process to end. This all began in 1988 and it is time to get on with things.

I know about the Metal Mine Reclamation Act and what it requires. I participated in the efforts which revised the act both in 1993 and in 1995. I also know that this Draft EIS addresses each of the requirements contained in that Act and that it complies with this law and all the other laws that regulate mining in the state of Montana.

108-1 I would like to talk about the Partial Backfill Alternative and the language under the Agency Preferred Alternative under the section on Pit Reclamation Feasibility in the Summary of the Draft EIS. I totally agree with your conclusion but not with your written reasons. The economics of reclamation is something that does need to be considered. I agree with that. But the last paragraph reads as though simply because Golden Sunlight doesn't get a positive return on their investment, we don't have to partially backfill.

We already know how people like Tom France from the National Wildlife Federation feels about this. The newspaper headlines and articles told us all about it. We also have a pretty good idea about what they would like to see happen here at Sunlight. Those of us who work at Golden Sunlight know that Tom France and Jim Jensen want to see you require us to backfill the pit. The kind of language found in this Summary just plays into their hands. I don't think it has to.

250

Response to Letter 108

108-1 Comment noted. Please see the Responses to Comments 16-37 and 23-5.

Letter 108 Continued

108-1 I would like you to discuss items other than economics in your summary. In fact, economics should be the last thing on the list. I'm sure that my bosses don't see it that way but I think you need to demonstrate, in the summary, that the reclamation laws of this state have been fully taken into account, that this EIS complies with each and every one of the points in the law and that partial backfilling is not necessary. All of the points you need are scattered throughout the document. You've already studied each of them. All you need to do is pull them together and put them up front. The Summary is the only thing that most people read and it sure is the section that people like Tom France and Jim Jensen are focusing on.

Please make the necessary changes to the Summary before the final EIS is prepared and I would also ask you to move forward with this as quickly as you can. My job is partially in your hands right now and I would like you to remember that fact when you go back to your offices in Helena and continue to work on this document.

Regards,

Martin L Johnson

Martin L. Johnson

Response to Letter 108

Letter 109

Mr. Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
PO Box 200901
Helena, MT 59620-0901

RECEIVED
DEC 13 '97
[illegible]

Dear Mr. Hallsten:

Please accept this letter as written support of Golden Sunlight Mine's Operating Permit No. 00065.

The Golden Sunlight continually proves it's efforts to protect and improve the local environment by creating wildlife habitats, maintaining high water standards, and providing a [illegible] innovative reclamation technique. Besides supporting the environment, the GSM supports countless causes in the community including the local schools and clubs.

I urge you to approve the final EIS for the Golden Sunlight. I love my community and do not want to have to leave because of my husband losing his job. Do you want the guilt of 200 workers going home to their families with the news of mine shut down? I know I wouldn't!

Response to Letter 109

Thank you for your letter. No response necessary.

Letter 109 Continued

Thank you for taking the time to read my letter. I really hope I can count on you in repairing this process.

Sincerely,

Michelle Johnson

[illegible]

Response to Letter 109

Letter 110

RECEIVED
DEC 16 1997

December 12, 1997

Mr. Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
P.O. Box 200901
Helena, Montana 59620-0901

Dear Mr. Hallsten:

This is my personal plea to you to please expedite preparation of the Final EIS by incorporating the DRAFT EIS as is, so that the record of decision can be issued as soon as possible and Golden Sunlight can proceed with its expansion. As you well know, this decision affects not only the 205 FAMILIES who are working there but many, many businesses in the area plus the welfare of the county and state.

I would not urge this plea if I didn't feel confident that the Mine would be operating within all safety regulations required. This has always been their concern whether it was their employees, the land, the water, wildlife or whatever. I am sure you have received many letters reinforcing the fact that the Mine is going overboard to conduct its business in a manner necessary to warrant your approval of the Final EIS.

I was born in the Whitehall Hospital in 1942 and graduated from WHS in 1960. In 1973 I bought a little restaurant business and have been in operation since. I am proud to be in Whitehall and feel we all have to help each other to succeed. My daughter recently married and just purchased my business and I hope the Mine will be able to stay in business without these black clouds and gross obstacles which could force closure before their necessary time.

THANKING YOU IN ADVANCE FOR YOUR SUPPORT.

Jean M. Jones
Retired Owner - A&W Restaurant
Jean M Jones
83 First Road
Whitehall, MT 59759
406-287-5520

Response to Letter 110

Thank you for your letter. No response necessary.

Letter 111

Trenton Jones
3115 Paxson
Butte, MT 59701

RECEIVED

JAN 0 5 1998

[illegible]

January 5, 1998

Montana Department of Environmental Quality
Impact Assessment Bureau
P.O. Box 200901
Helena, MT 59620-0901
Attention: Greg Hallsten

RE: Golden Sunlight Mine Draft EIS

Dear Mr. Hallsten:

I have invested 10 years of my life working for Golden Sunlight Mine as a heavy equipment operator. My wife and I have one son. I am also an instrument rated pilot and enjoy flying and skiing when my time allows.

You know, ever since I have been in mining, everything has been up in the air. Every day you find yourself wondering about the next day and what it may hold and that really affects people. It just doesn't seem right. I know that there are strict laws that have to be followed and that everyone these days is more concerned about the environment than ever before, but still, being able to get a permit to expand a mine shouldn't take 10 years. It seems as though the rules of the game are always changing in mid-stream and it is becoming more and more difficult to earn a living in this industry unless you want to live in Chile or Russia. Bruce Springsteen's song "My Hometown" has a line in it that says something like "These jobs are goin' boys and they ain't comin' back". I think about that line a lot these days and I'm afraid that is what is going to happen if we don't get the permit sometime in the spring.

111-1 During scoping for this EIS an issue was raised on "Construction feasibility concerns regarding pit backfilling activities under the Partial Backfill Alternative". On page 18 of the Summary, this issue is addressed. It states that worker safety and consistent cover of pit wall surfaces are concerns for the proposed placement of backfill in the pit. It goes on to say that the DEQ has developed a Mitigation Measure G-5 that provides for an evaluation of potential alternative construction methods. These include backfilling by working up from the bottom of the pit, rather than end dumping, to create a more consistent fill and reduce the risks to workers. However, greater volumes of backfill material would be required, and the method may be cost-prohibitive. Another method to consider is the use of remote-controlled equipment for grading of the pit wall cover slopes, to minimize safety risks to worker. Alternative construction methods would likely entail considerable additional costs, and would not contribute to a reliable long-term reclamation plan.

Response to Letter 111

111-1 Comment noted. Please see the Response to Comment 23-5.

Letter 111 Continued

111-1 Those of us who work at Golden Sunlight Mine take great pride in our safety record and for the second time are approaching one million man hours without a lost time accident. If partially backfilling the pit increases the risks to workers and if robots would be needed to ensure our safety, I think those are darn good reasons for not requiring backfilling at Sunlight. Especially when backfilling may not provide convenient fill, costs a ton of money that this company doesn't have and really does nothing for the environment short of providing a few more acres of grass. My life is not worth a few acres of sagebrush or grass. Nobody's is.

I would like you to include worker safety in your dialogue for not choosing to accept the partial backfill alternative. As someone who has driven a 170 Ton truck and operated a shovel in the Golden Sunlight Mine pit, trust me, my safety and the safety of my co-workers should be important enough to warrant a few lines of print.

Respectfully yours,

Trenton Jones

JB

Response to Letter 111

Letter 112

[illegible]
[illegible]
[illegible], MT [illegible]

January 5, 1998

RECEIVED
JAN 1 3 1998
[illegible]

Mr. Greg Hallsten
Department of Environmental Quality
[illegible] Bureau
P.O. Box 200901
Helena, 59620

Dear Greg,
As an employee of Golden Sunlight and a life-long Montana resident, I feel that I have a strong feel for the need of balance between industry and the environment. Environmental disturbance is an extremely sensitive social and political subject in Montana, however, any decisions regarding such issues must be based on engineering data and scientific fact.

I have reviewed the draft EIS document and am relieved that the proposed reclamation alternative is one indeed based on data and fact. I support the proposed alternative and feel that it offers realistic and reasonable reclamation solutions that will guarantee suitable wildlife habitat and high water quality standards following the end of Golden Sunlight's mine life.

112-1 Regarding the issue of partial pit backfilling, however, I fear that much to much emphasis was placed on Golden Sunlight's economic wellbeing. Although profitability should play a roll in the decision, DEIS language concerning Golden Sunlight economics overshadowed more environmentally sound reasons for no partial pit backfilling.

The Golden Sunlight pit will be dry and thus will not be a threat to migratory water fowl. Water will be pumped from underground levels below the ultimate pit floor elevation and treated. Partial pit backfilling will not preclude pumping and water treatment. Partial pit backfilling will require extensive continued heavy equipment use after ore extraction has been completed. Any environmental benefits derived from partial pit backfilling will be more than offset by noise, dust, and exhaust emissions produced during backfilling.

Should partial pit backfilling be required, Golden Sunlight will lose approximately 400,000 ounces of proven gold reserve from the Stage 5 plan. Future gold price and technology improvements will quite possibly make future mining operations at the Golden Sunlight site economically feasible. However, this future resource could be lost by covering gold values below the pit floor under tons of waste material. Mining has historically been a significant contributor to Montana's economic health. Deliberately thwarting future responsible mining activity would not be in the best interest of the citizens of Montana.

It is comforting to know that our regulatory agencies base such important decisions as the Golden Sunlight's operating permit reclamation alternatives on fact and not on social and political pressures. A record of decision favoring the preferred alternative in the DEIS will send a message that Montana is not anti-mining and does understand that there is a realistic balance between industry and the environment.

Sincerely,

[illegible]

Response to Letter 112

112-1 Comment noted. Please see the Response to Comment 23-5.

Letter 113

RECEIVED
JAN 21 1998
[illegible]

January 14, 1998

Jim Keane
2131 Wall Street
Butte, MT 59701

Mr. Greg Hallsten
MDEQ
P.O. Box 200901
Helena, MT 59620-0901

As a lifelong resident of Montana, who for the past 40 years has been either directly or indirectly involved in mining, I am writing in support of the adoption of the Draft Environmental Statement for the Golden Sunlight Mine.

Along with being a Journeyman Operating Engineer, I am also a Montana Certified Vocational Instructor, and an avid sportsman. This state desperately needs the cooperation of both industry and responsible environmental people like me, who recognize the benefits of a corporation like Golden Sunlight Mine. Over the years Golden Sunlight, while providing good paying jobs with outstanding benefits, has also demonstrated an environmental responsibility. When problems occurred at the mine, they demonstrated this responsibility by stopping operations and correcting the problem of pit wall subsidence. These actions have demonstrated to all of Montana that the state should provide help to Golden Sunlight to keep it operating as long as possible.

Please recognize that the back filling of the pit does not provide any useful purpose. It is just a proposal of radical environmentalists trying to stop all mining in Montana. This is not fair or prudent to the development of the natural resources located in this state.

Sincerely,

Jim Keane

Response to Letter 113

Thank you for your letter. No response necessary.

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PAGE

Letter 114

NOV [illegible]

2401 Grayson Court
Helena, MT 59601
November 22, 1997

Mr. Greg Hallsten
Montana Department of Environmental Quality
P.O. Box 200901
Helena, MT 59620-0901

Dear Mr. Hallsten:

First may I say how very much impressed I was when I reviewed your 2-volume Draft Environmental Impact Statement on the GOLDEN SUNLIGHT MINE.

The amount of research done in that EIS is heartwarming. Looks like you have "covered the waterfront" for sure.

Now then I heartily ENDORSE THE PROPOSED ACTION AS MODIFIED BY THE RETURN DIVERSION.

Golden Sunlight provides many good-paying jobs to MONTANA PEOPLE! They have generated millions of dollars in tax revenu over the years. They are just the kind of people WE WANT TO KEEP IN MONTANA!

By all means let us speedily grant them the necessary permits.

114-1 (On your proposal of "No Pit Pond", I say NO! Here's why: the very waters that would accumulate in the pit at the end of mining are PRESENTLY PERCOLATING THROUGH THE COUNTRY ROCK in the mine vicinity! They are DOING NO HARM. Why put Golden Sunlight to great unnecessary expense creating a sump and pumping at considerable cost for ever and ever, even on the SUPPOSITION that wildlife will suffer if it drinks pit water. Look at the filthy water that the same wildlife presently drinks in gullies around the mine area-- filty because of purely natural circumstances like animal dung, rotting animal bodies, minerals leached out of the native rocks year after year. EVEN SO THE WILDLIFE IS DOING JUST FINE. NIX ON THE PROPOSAL FOR "NO PIT POND".)

Sincerely yours,

William F. Klein, Jr.

William F. Klein, Jr.

Response to Letter 114

114-1 Comment noted. Please see Section IV.B for a discussion of impacts to water resources.

Letter 115

Dear Mr. Hallsten

I am writing to you in support of Golden Sunlight Mines proposed action in the Environmental Impact study recently released.

I feel Golden Sunlight commitment to the environment, the community, and the state of Montana have been unsurpassed.

115-1 The partial pit backfill alternative should not be considered, since it would provide little if any environmental benefit. The water still has to be treated with or without backfilling.

I urge the DEQ and BLM to please expedite the process so Golden Sunlight can continue to operate and support families communities and the state of Montana.

Thank you
Mike [illegible]

RECEIVED
DEC 15 1997

Response to Letter 115

115-1 Comment noted. Please see the Response to Comment 23-5.

Letter 116

December 11, 1997

Mr. Greg Hallsten
MDEQ
PO Box 200901
Helena, MT 59620-0901

RECEIVED
DEC 16 1997

Dear Mr. Hallsten:

I am writing in support of the proposed expansion of the Golden Sunlight Mine. I believe the draft EIS evaluates all environmental concerns very thoroughly and proves that the Golden Sunlight is willing to go the extra mile to make sure that these concerns are dealt with appropriately.

116-1 The backfill alternative seems to me to be a smokescreen to hold up the preparation of the final EIS when the draft proves that there would be little environmental benefit.

I urge you to prepare the final EIS without further delay. There are hundreds of families depending on the expansion to ensure the well being of their families.

Sincerely,
Shera Korner

Response to Letter 116

116-1 Comment noted. Please see the Response to Comment 23-5.

Letter 117

December 2, 1997

Mr. Greg Hallsten
MDEQ
P.O. Box 200901
Helena, MT 59620-0901

Dear Mr. Hallsten,

This letter is written in support of Golden Sunlight Mine's Operating Permit No. 00065, which would allow continuation and expansion of mining operations near Whitehall, Montana. After reading the draft EIS document, I have concluded that the current preferred option clearly is an environmentally sound option that allows economic extraction of the current gold resource without covering possible future resources left in the walls and below the pit.

117-1 Much negative press has recently been published in Montana newspapers implying that the partial backfilling of the pit option was not given fair consideration and therefore should discredit the EIS document. The EIS document covers the backfilling option thoroughly and shows that there is no advantage in Golden Sunlight's case for backfilling the pit environmentally or economically. I believe this is simply a concerted effort on the part of environmental extremist groups to eliminate surface mining in Montana and the United States. Golden Sunlight has an excellent environmentally sound operating record. Golden Sunlight has never contaminated the Jefferson River waters and their operating plan ensures that it will never be polluted as a result of continued and expanded mining operations.

I encourage you to expedite this EIS process and approve the currently chosen alternative soon, because timing is critical for initiating the Golden Sunlight Mine expansion. Delays decrease the profitability of the mine. Golden Sunlight Mine has already spent two years diligently addressing with sound scientific studies all of the concerns that were brought forward by government agencies, environmental groups, and the public concerning the impacts of the mine expansion. The draft EIS was a very thorough study that covered all of the environmental impacts. I believe the best alternative was selected in the Draft EIS and should be incorporated in the final EIS document as is. Golden Sunlight Mine is also an important contributor to the Montana economy by providing jobs and purchasing voluminous goods and services. Thank for your time and consideration of my point of view.

Sincerely,

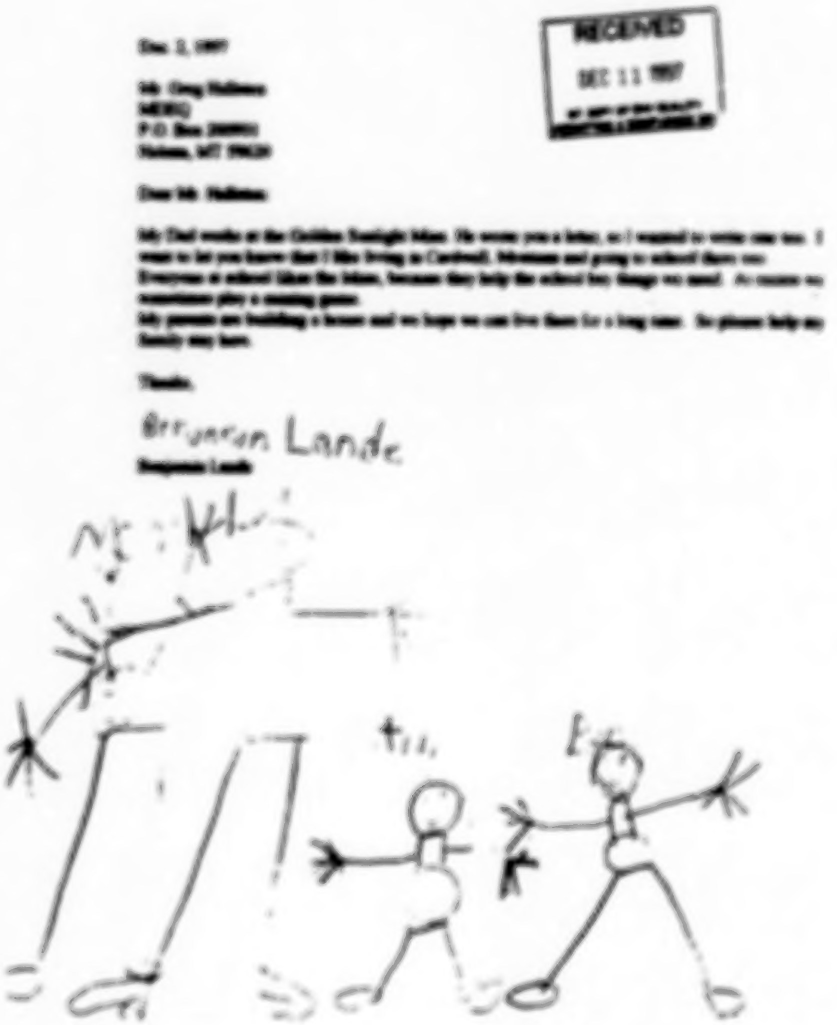
Andy Lunde

Andy Lunde

Response to Letter 117

117-1 Comment noted. Please see the Response to Comment 23-5.

Letter 118



RECEIVED
DEC 11 1997

Dec. 2, 1997

Mr. Greg Hallsten
MDEQ
P.O. Box 200901
Helena, MT 59620

Dear Mr. Hallsten:

My Dad works at the Golden Sunlight Mine. He wrote you a letter, so I wanted to write one too. I want to let you know that I like living in Cardwell, Montana and going to school there too. Everyone at school likes the Mine, because they help the school buy things we need. At recess we sometimes play a mining game.
My parents are building a house and we hope we can live there for a long time. So please help my family stay here.

Thanks,

Benjamin Lande
Benjamin Lande

Response to Letter 118

Thank you for your letter. No response necessary.

Letter 119

DEC 8 1997

Dec. 1, 1997

Mr. Greg Hallsten
MDEQ
P.O. Box 200901
Helena, MT 59620

Dear Mr. Hallsten:

I am writing to ask you to support the Golden Sunlight Mine's Operating Permit No. 00065. Approval of the permit would allow the Golden Sunlight Mine to continue gold production, as well as, its commitment to the environment, employees, and surrounding communities. The scientific methods used to formulate the Draft EIS are a common sense approach to utilizing our natural resources safely and wisely.

The Golden Sunlight Mine is a good neighbor, helping the surrounding communities in many ways. As the hunting season winds down, I am alerted to the many outdoors men/women taking the opportunity to hunt on Golden Sunlight Mine property. Golden Sunlight Mine employees have developed mining education programs addressing modern mining practices, which are taught in the public schools, at their request. The Golden Sunlight Mine's tour program, open to the public, encourages people to see how a modern, environmentally safe gold mine is operated. They also give financial support to various community programs, including the public school system.

I believe it would be unethical to close or aid in the closure of environmentally safe mines in the United States of America. The United States federal government has developed the strictest mining regulations in the world. These regulations address water, air, flora, fauna, and reclamation practices. Also, each State tailors regulations to specific mining sites. Hence, the safest place to mine the earth's natural resources is in our own country, with the toughest regulations.

I think many people who do not support mining have not been educated on modern mining practices. Also, most of these people really do support the mining industry by using products that are mined. Just a few examples of how our minable resources are used, by people, are in: medicines, computers, transportation, home construction, farming, and art, as well as, a safeguard against inflation.

The Golden Sunlight Mine's draft EIS has been developed in good faith to care for the land, water, air, and wildlife, now and in the future. I use gold and mining products every day. So I support the Golden Sunlight environmental policy and I ask again for you to do the same.

Sincerely,

[illegible] A. Lamb

D:\...mine97.wpd

Response to Letter 119

Thank you for your letter. No response necessary.

Letter 120

Mr Hallsten

After reviewing the EIS, I Find that there should be an Imidate Decision to Give the Golden Sunlight mine the Go-Ahead for the expansion. The G-S-M provides income not only For the working people in the surrounding area, but also supports the State of Montana.

I Feel that the G-S-M has thorily examined the expansion that they wish to do, and an imidate go ahead should be Allowed.

Sincerely Brian Luckfink

RECEIVED
DEC 11 1997

Response to Letter 120

Thank you for your letter. No response necessary.

Letter 121

January 20th, 1998

RECEIVED
JAN 23 1998
[illegible]

Mr. Greg Hallsten
Department of Environmental Quality
State of Montana
P.O. Box 200901
Helena, MT 59620-0901

Subject : Golden Sunlight Mine Operating Permit No. 00065
Application for Expanded Operations
DRAFT Environmental Impact Statement

Dear Mr. Hallsten,

The purpose of this letter is to provide you with my observations and comments regarding the DRAFT Environmental Impact Statement (DEIS) on the Application for expanded operations at the Golden Sunlight Mine (GSM) in Whitehall. I believe the DEIS provides a thorough review of the alternatives and their respective environmental effects.

As a concerned citizen living in Butte, I am writing to support your immediate approval of the GSM proposed expansion in the recently released DEIS. After reviewing the documents, I am in full support of the GSM expanded operations.

Throughout its history of operations, the GSM has continually demonstrated its commitment to environmental protection with its land purchases to preserve and develop wildlife habitat around the mine site. GSM has operated in a responsible manner, utilized its resources to develop public access, establish training facilities, and provide improved animal habitats. I believe that philosophy of good corporate citizenship will continue to make Golden Sunlight one of the leading examples of responsible mining in our state.

121-1 Golden Sunlight will reclaim more than 2,500 acres when mining is completed. The use of "avoidance" as a mitigation measure to protect bird-nesting habitat (Measure MF-4) is unrealistic and could force GSM to suspend its operations. GSM's off-site preservation of wildlife habitat, and their on-site reclamation, provides sufficient replacement habitat for birds. They also have purchased over 4,300 acres of off-site land, and lease an additional 1,900 acres of off-site land, to preserve open space and wildlife habitats around the mine site. Avoidance during operations as a mitigation measure should not be further considered in the Final EIS.

The mine's Water Management Plan and mixing zone analysis is very detailed and goes above and beyond what is required, i.e., the extra 'factor of safety' needed, to protect water quality. The DEIS and its Water Management Plan provides sufficient contingencies to protect water resources and their downstream beneficial uses. Appendix N also provides a good analysis that shows how GSM will comply with the Section 404 requirements of the U.S. Army Corps of Engineers. GSM's proposed water management, reclamation and habitat preservation work as described in Appendix N will more than compensate for any loss of "Waters of the U.S." from placing waste rock in the dry gulches on site.

Response to Letter 121

121-1 Comment noted. Please see the Response to Comment 23-2.

Letter 121 Continued

121-2 The partial pit backfill alternative should not be further considered since it will do little to improve what is already a thorough and well thought out Reclamation Plan and will have little environmental benefit. Water will still have to be handled, with or without backfilling, and there would be no improvement to wildlife habitat or air quality. Most importantly, pit backfilling will force the mine to close prematurely, which is the same result as the No Action Alternative. The more than 200 jobs that would be lost now due to backfilling are too high a price to pay just to revegetate 235 acres that won't even be visible from the surrounding area. Requiring GSM to backfill their open pit just to cover 235 acres of pit highwall is economically and environmentally absurd and does not warrant further consideration.

The GSM is a major economic contributor to the State of Montana, Jefferson, Madison and Silver-Bow Counties, the cities of Whitehall, Butte and numerous other surrounding communities. GSM purchases more than $21 million in goods and services annually. Their annual payroll of $10 million supports well over 200 families and the businesses those families patronize, i.e., "the economic rollover effects". In addition to this economic importance, GSM contributes significantly to the area's social well being, through donations and support of valuable community projects.

Finally, a personal observation. As a professional Environmental Engineer in Montana for the past 20 years, I have witnessed firsthand the gradual demise of natural resource extractive industries in Montana and throughout the U.S. Along with the loss of primary extractive industries goes the loss of secondary mineral processing and manufacturing industries which "add value" to those resources. The continued loss of U.S. jobs and economic drivers provided by primary and secondary extractive industries will eventually hurt the viability of the U.S. in the competition for resources in the global marketplace, including military preparedness.

Additionally, environmental concerns are best addressed and controlled at home. The primary and secondary resource extractive industries are continuing to expand rapidly throughout the world. However, they are continuing to decline in the U.S. Mining, mineral processing and manufacturing industries from the U.S. are now being pushed off onto third world countries which don't have the multitude of resources necessary to regulate and control them. Consequently, significant environmental and economic damage is occurring, and increasing, worldwide on a very large scale. This situation is driven partially, yet significantly, by the costs of over-regulation and bureaucracy in Montana and throughout the U.S. An "environmentalist" who is informed on global industrial trends, would generally support continued industrial growth at home, where we can properly regulate and control industrial growth in a manner which minimizes environmental damages and maximizes the benefits to the U.S. economy. The proposal to expand operations at the Golden Sunlight Mine is an excellent industrial opportunity for us, i.e., the U.S., to consider, evaluate **and support**, providing it is properly designed, operated and reclaimed. I believe the GSM expanded operations fit that bill perfectly.

Further delays in GSM's DEIS could seriously jeopardize its operation. I urge the Montana DEQ and the BLM to expedite preparation of the Final EIS by incorporating the DEIS as is, so that the Record of Decision (ROD) can be issued as soon as possible and GSM can proceed with their expansion.

Thank you for this opportunity to comment. I look forward to your approval of the GSM Application. If you have any comments or questions regarding any of the above matters, please contact me at your convenience.

Response to Letter 121

121-2 Comment noted. Please see the Response to Comment 23-5.

Letter 121 Continued

Gratefully,

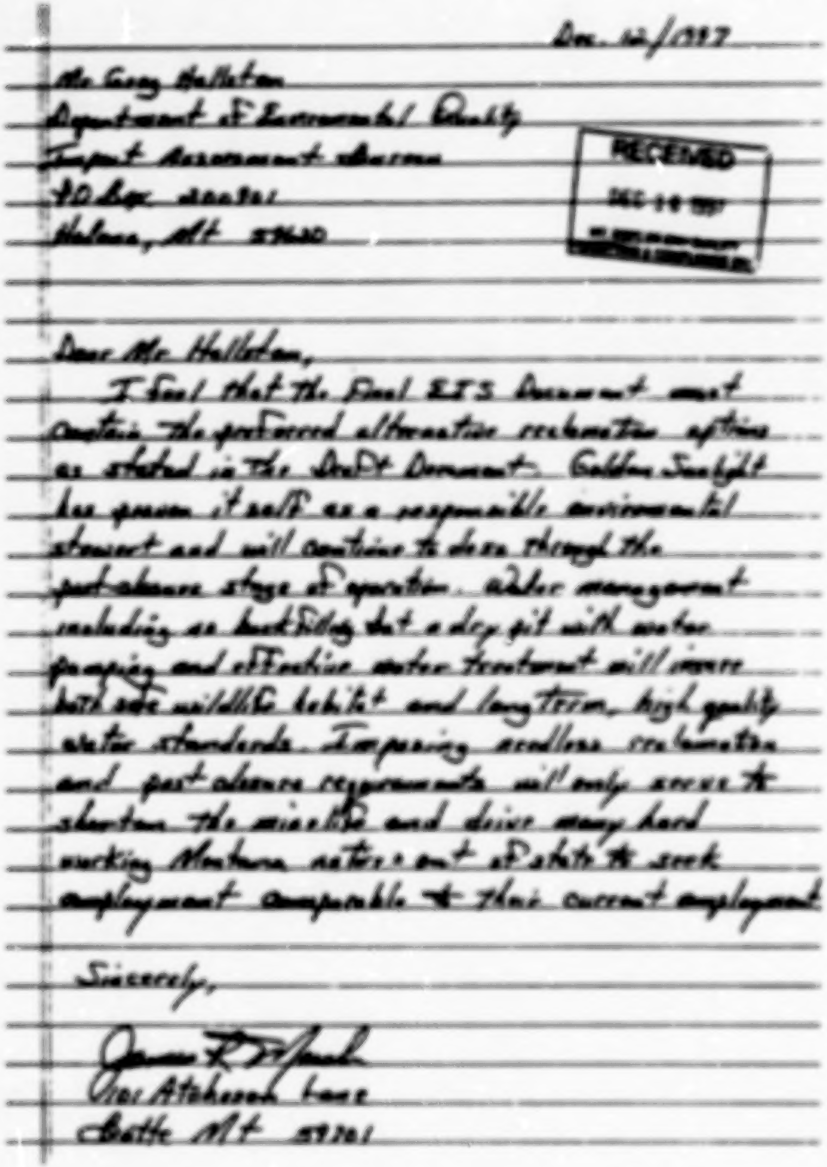
Thomas M. Malloy

Thomas M. Malloy
Environmental Engineer

423 South Jackson Street
Butte, Montana 59701
(406) 723 - 1174

Response to Letter 121

Letter 122



Dec. 12/1997

Mr Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
PO Box 200901
Helena, MT 59620

RECEIVED
DEC [illegible] 1997

Dear Mr Hallsten,

I feel that the Final EIS Document must contain the preferred alternative reclamation options as stated in the Draft Document. Golden Sunlight has proven itself as a responsible environmental steward and will continue to do so through the post-closure stage of operation. Water management including no backfilling but a dry pit with water pumping and effective water treatment will insure both safe wildlife habitat and long term, high quality water standards. Imposing needless reclamation and post-closure requirements will only serve to shorten the mine life and drive many hard working Montana natives out of state to seek employment comparable to their current employment.

Sincerely,

James R

1101 Atcheson Lane
Butte MT 59701

269

Response to Letter 122

Thank you for your letter. No response necessary.

Letter 123

Robert L. Marks
40 Ohio Gulch Rd
Clancy, Mt. 59634

Jan 16 1998

RECEIVED
JAN 21 1998
[illegible]

Mr. Greg Hallsten
MDEQ
P O Box 200901
Helena, Mt. 59620-0901

Re: Golden Sunlight Mine Amendment 008 to Operating Permit #00065

Dear Sir:

After reviewing the summary of the Draft EIS on the above application, and after visiting the mine site and getting an orientation of the effects of the same I urge your department to grant the application with the preferred alternative.

123-1 The consideration of pit backfill or partial backfill is not feasible for many reasons, exclusive of economics, and would add no measure of environmental enhancement. I believe a rationale for such unfeasibility on non economic factors exists and should be addressed in the permitting document.

This permit application has been active for nearly a decade and it is time to act and allow the extension of the GSM project to proceed.

Thank you for consideration of my support.

Sincerely,

R. L. Marks

Robert L. Marks

Response to Letter 123

123-1 Comment noted. Please see the Response to Comment 23-5.

Letter 124

Mr. Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
P.O. Box 200901
Helena, Montana 59620-0901

12-11-97

RECEIVED
DEC 16 1997
MT DEPT OF ENV QUALITY
PERMITTING & COMPLIANCE DIV

Dear Mr. Hallsten

I am writing you in support of Golden Sunlight Mines operating permit No. 00065. The Draft E.I.S. is a very thorough document. I feel it covers everything from the water management plan to final reclamation.

The partial backfill of the pit should not be considered because it will force the mine to shut down early and that would have a significant economic impact on the community and the surrounding area.

I hope you will do everything in your power to establish a final E.I.S.

Sincerely
Bob [illegible]
65 South Boulder Road
Cardwell, MT. 59721

Response to Letter 124

Thank you for your letter. No response necessary.

Letter 125

Mr. Greg Hallsten
MDEQ
P.O. Box 200901
Helena, MT 59620-0901

RECEIVED
JAN 1 6 1998
[illegible]

January 14, 1998

Dear Mr. Hallsten

As a concerned member of one of the communities supported by the mining activities ongoing at the Golden Sunlight Mine (GSM), I am writing to support the GSM Proposed Actions in the recently released Draft Environmental Impact Statement (EIS).

I believe the EIS truly provides a thorough review of the alternatives and their respective environmental effects. The EIS includes a comprehensive water management plan that provides sufficient contingencies to protect water resources and their downstream beneficial uses. GSM's past practices have provided solid proof that the organization is genuinely responsive to maintaining and improving the environmental quality of the area impacted and surrounding the mine site. My faith in GSM's responsive land stewardship has been solidified by their recent purchase of 4,300 acres off site and lease of an additional 1,900 acres off site for land and habitat preservation. Their reclamation plan already calls for the reclaiming of more than 2,500 acres of site land when the mine eventually closes.

125-1 The partial pit backfill alternative should not be considered since it will provide very little environmental benefit. Water will still have to be handled and this measure would provide no improvement to wildlife habitat or air quality. It would also increase the cost to mine which would force the mine to close prematurely, impacting the financial stability of our communities.

125-2 The use of "avoidance" as a mitigation measure to protect bird nesting habitat (Measure MP-4) is unrealistic, in fact idiotic. GSM's off-site preservation of wildlife habitat, and their on-site reclamation, provides sufficient replacement habitat for birds. Avoidance during operations as a mitigation measure should not be considered in the Final EIS.

GSM has operated in a responsible manner and utilized it's resources to develop public access, establish training facilities and provide animal habitat. GSM has demonstrated good corporate citizenship and continues to be a leader in responsible mining in our state.

I urge the Montana Department of Environmental Quality and the Bureau of Land Management to expedite preparation of the Final EIS by incorporating the Draft EIS as is, so that the record of decision can be issued as soon as possible and GSM can proceed with the expansion. Please do what is right for the citizens of the area communities, which is: expect responsible land stewardship, sustain standard of living, and maintain and increase industrial employment.

Sincerely,

Jay McClosky

Response to Letter 125

5-1 Comment noted. Please see the Response to Comment 23-5.

125-2 Comment noted. Please see the Response to Comment 23-2.

Letter 126

Mr. Gary Halsten
Department of Environmental Quality
Impact Assessment Bureau
PO Box 20091
Helena, Montana 59620

RECEIVED
DEC 16 1997
[illegible]

Dear Mr. Halsten:

I am writing to you in support of Golden Sunlight Mines Proposed Action, found in the recently released Draft Environmental Impact Statement that reviews a proposed expansion of their mine in Whitehall, Mont.

I believe the Draft EIS provides a thorough review of the alternatives and their respective environmental effects. The EIS includes sufficient contingencies to protect water, the environment and the [illegible] base.

I urge you to expedite the EIS process and to issue a final EIS as quickly as possible.

Sincerely,
Wade [illegible]
[illegible] Ridge Road
Silver Star, Montana
59751

Response to Letter 126

Thank you for your letter. No response necessary.

Letter 127

12-22-97

RECEIVED
DEC [illegible] '97
MT. DEPT OF ENV QUALITY
PERMITTING & COMPLIANCE DIV

To Mr. Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
PO Box 200901
Helena, Montana, 59620

From Steve McDonnell
Circle S Seeds of Montana, Inc.
Box 130
Three Forks, Montana, 59752

Dear Mr. Hallsten,

I am writing you today in support of Golden Sunlight Mines' Operating Permit No. 00065, which could allow the expansion and continued operation of Golden Sunlight Mine.

Golden Sunlight Mine has prepared a detailed draft EIS and Water Management Plan and I feel that not only do they have a good plan to protect the water--they have proved that they are responsible in the way they treat our local environment.

I support their application for a 404 permit and feel their cooperative attitude shows their goodwill and good intentions.

I hope that you will examine the facts , review the application and grant Golden Sunlight the necessary permits for expansion and continued operation.

This business, its employees and their families are a big component of the economies of Southwest Montana and the community where I live.(Three Forks).My company not only does business directly with Golden Sunlight, but also with many of the employees of GSM. This company is a good and responsible neighbor. I would ask you to get to the Final EIS and issue the ROD. This needs to be done- not only for Golden Sunlight Mine, but also for their employees, their families and the economies of Southwest Montana. Thank you.

Yours,

Steve McDonnell

Response to Letter 127

Thank you for your letter. No response necessary.

Letter 128

Jan. 14, 1998

RECEIVED
JAN [illegible] 1998

Greetings,

This letter is in response to the Draft EIS for the Golden Sunlight Mine Expansion. Based on what I have observed and read about the mine's progress over the past several years, my opinion is that the findings of the Draft EIS are as I would have expected: quite satisfactory. Mining is one of Montana's primary forms of industry, and GSM is a success story in the history of mining in this state. The mine has a good reputation for its reclamation efforts, and it has appeared to have "paced" itself in such a manner as to profitably extract its ore while generally keeping people employed and not tearing up the country.

The Draft EIS indicates that the mine has appropriate mitigation and reclamation plans to address concerns for the environment, including soil, water and wildlife habitat. The Agencies involved seem to support the overall intentions of GSM, according to the Agency-Preferred Alternative. The rationale for the Preferred Alternative gives good justification for that support, and I think that the Agencies have done their job. 128-1 I too, endorse the Agency-Preferred Alternative. I strongly disagree with the Partial Backfill Alternative. Partial backfilling would be basically non-beneficial in that it could cause difficulty for future access to remaining ore reserves. It could also reduce access for tunnel mines that would be entered from the pit walls. In addition, I question the feasibility of handling toxic ground water in areas that have been backfilled. Basically, partial backfilling would seem to be a very premature measure at this stage in the mine's life, and in light of the other proposed methods of remediation, unnecessary.

128-2 I would like to take this opportunity to mention that I believe that the current and proposed activities of GSM are such to allow a greater effort toward aesthetics. As the mine has grown over the last few years, it has become increasingly visible from Interstate-90. I submit that the mine, in the formation of its dump slopes, consider more terracing and rounding of squared edges, in a manner which more closely imitates the natural landscape. Even before ongoing reclamation replaces the vegetation on those slopes, this might enhance the visual effect as seen from the highway. Montana's most cherished resource is its beauty, and nothing stirs up those who would shut down utilitarian uses of the land, like an obvious disturbance seen from such a high-exposure travel route.

Thank you for the opportunity to be heard,

Noelle L. Meier
PO Box 834
White Sulphur Springs, MT 59645

Response to Letter 128

128-1 Comment noted. Please see the Response to Comment 23-5.

128-2 Comment noted. GSM's current and proposed reclamation plans contain measures to reduce visual contrasts. See Section IV.I, Aesthetic Resources.

Letter 129

RECEIVED
DEC 15 1997
MT DEPT OF ENV QUALITY
PERMITTING & COMPLIANCE DIV

Dear Mr. Hallsten

I am writing in support of Golden Sunlight Mine's proposed Action Alternative, which would allow continued and expanded operation of the mine in Whitehall, Montana.

I am in support of Golden Sunlight Mine's mixing zone analysis. It is a common sense approach to protect downstream beneficial water uses. I also support GSM's application for Section 404 permit from U.S. Army Corps of Engineers.

129-1 I do not support the partial backfill of the pit. It will provide very little environmental benefit. It would force the mine to close prematurely, putting over 200 families in financial jeopardy.

I urge you to expedite the EIS process and to issue a final EIS as quickly as possible. GSM's annual $10 million payroll supports my family and over 200 other families in this community. It also generates another $21 million in economic activity through the purchase of goods & services. Further delay in the issuance of a Record of Decision undermines the operation's viability and the tremendous economic & social benefits the mine provides.

Thank you

[illegible] Mill Maint. Golden Sunlight Mine

276

Response to Letter 129

129-1 Comment noted. Please see the Response to Comment 23-5.

Letter 130

Mr. Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
P.O. Box 200901
Helena, Montana 59620-0901

RECEIVED
DEC 16 199

Dear Mr. Hallsten;

I am writing to you to show my support of Golden Sunlight Mine Proposed Action of the Environmental Impact Study.

I believe Golden Sunlight Mine has demonstrated over and over their commitment to the environment and environmental policies and regulations.

130-1 I believe the partial pit backfill alternative should not be considered. I can not see where this alternative would be any benefit to the environment or wildlife.

I would ask the D.E.Q and B.L.M to finish the final E.I.S.

Response to Letter 130

130-1 Comment noted. Please see the Response to Comment 23-5.

Letter 130 Continued

as soon as possible so a decision may be rendered and Golden Sunlight Mine may proceed with their expansion

Thank You
Sincerely
Chris M. Nelson

Response to Letter 130

Letter 131

Mr Greg Hallsten
Dept of Environmental Quality
Impact Assessment Bureau
P.O. Box 200901
Helena, Montana 59620-0901

Mr Dave Williams
BLM - Butte District
Headwaters Resource Area
P.O. Box 59702
Butte, Montana 59702

RECEIVED
DEC 15 1997

Dear Mr Hallsten & Mr Williams,

I am very concerned about the Environmental Impact Study recently released by your department involving the Golden Sunlight Mine.

The Golden Sunlight Mine has always tried to maintain the best quality to protect the environment. To the best of my knowledge, the deer still graze close to the mine and the water and air has not caused a problem for our community.

The mines water management plan and

Response to Letter 131

Letter 131 Continued

the mixing zone analysis is very detailed. This again shows the measure of quality the mine provides for all concerned.

131-1 It seems to me if this partial pit backfill was enforced, it would not benefit anyone including yourselves, since the water would still have to be handled. Would this benefit the wildlife or the air? The best would be as the mine has it, not disturbing either wildlife or the air quality.

If your requests are enforced their is no telling how it would affect many families who work there, not to mention the community. The mine has been extremely generous to our schools and town. To squeeze and squeeze the Golden Sunlight mine to closure would cause alot of harm to us.

The Golden Sunlight Mine has managed and with great care and pride taken care of all the land the have used. I am not ashamed of the appearance

Response to Letter 131

131-1 Comment noted. Please see the Response to Comment 23-5.

Letter 131 Continued

of the land the mine has used. They The Golden Sunlight Mine has done a service for almost everyone in the United States, anyone who has a computer that has gold in it. Peoples teeth that are capped with gold and so on and so forth. Can you yourself fall in the category?

I truly hope the DEQ and the BLM to expedite preparation of the Final EIS by incorporating the draft EIS as is so that the Record of Decision can be issued as soon as possible and Golden Sunlight can proceed with the expansion.

Thank you,

Sincerely

Jeanne Nelson

Response to Letter 131

BEST COPY AVAILABLE

Letter 132

Mr Gary Hallsten
MDEQ
PO Box 200901
Helena

RECEIVED
DEC 18 1997

Dear Mr Hallsten

132-1 I am writing in support of the Golden Sunlight mine Draft EIS document proposed reclamation alternative. I am in full agreement with the "no pit Backfilling" option with the Butte pit. The Golden Sunlight pit will Be dry and thus present no hazard for water fowl or game animals. in addition pit Backfilling will stop mining from the existing pit Bottom should future Technology deem a mining operation economical in the future.

Golden Sunlight is a Valuable asset to Montana cutting this operation short Because of unnecessary reclamation requirements would certainly not benefit Jefferson county or Montana

Sincerely
Robert C.
Po Box 770
Whitehall, Mont 59759

Response to Letter 132

132-1 Comment noted. Please see the Response to Comment 23-5.

Letter 133

RECEIVED

JAN 1 [illegible] 1998

Impact Assessment Bureau

DEQ of Montana

Dear Sirs;

I favor the No Action Alternative with the No-Pit reclamation alternative as drafted in the Draft EIS for the Golden Sunshine Mine. The scope of future containment requirements for the size the mine presently exists already is beyond reason.

Maintenance of pump back wells and pumps. Maintenance of a treatment plant for 384 gallons a minute of toxic water, maintenance of miles of lined ditches and berms to divert storm water head the list. Roads and power lines will need to be maintained. Sludge laden with heavy metals from the evaporative treatment will need to be disposed of and monitored. Electricity will need to be provided. All into "perpetuity". And continually in the case of the treatment plant and pumps. th

This is as much a disaster as it is a mine. One generation has no right to leave such massive amounts of pollution for centuries to come. This is taxation without representation, it is pollution without representation. Such travesty of justice in this age of high-minded talk about "values" is hypocritical.

133-1 The various specific impacts of the Proposed Action would have massive adverse impacts on water quality in and around the area of the mine as the pit, the waste rock dumps and the containment ponds all expanded, exacerbating all the above mentioned problems of containment.

In addition, increasing the surface of the pit lake would attract more waterfowl. Increasing the depth of the pit lake by 300 feet would greatly increase the toxicity of the water and dry up springs when this water was drawn for de-toxification. Increased adverse impact on native plant life would be difficult if not impossible to reclaim. The proposed action would result in 27 million tons of additional tailings deposited in Impoundment No. 2, vastly increasing toxicity of groundwater threatening nearby rivers and requiring increased treatment capacity and sludge.

the

133-2 The only prudent and responsible action to take with this mine is one which considers future impacts. Future costs outweigh present benefits. Today's jobs are being paid for by tomorrow's taxes because mining companies don't last into "perpetuity". Please show a little courage and shut it down.

BEST COPY AVAILABLE

Response to Letter 133

133-1 Please see Section IV.B in the Draft EIS for a discussion of potential impacts to water resources. In addition, Section IV.P.2 and Appendices A and B describe measures to mitigate these impacts, including GSM's proposed water management plan. The agencies believe these measures will be adequate to mitigate potential impacts to water resources in the area of the mine. Please see the Responses to Comments 16-14, 16-43, and 16-44 regarding the potential impacts of tailing impoundment leakage.

133-2 The agencies require the applicant to post a bond of sufficient amount to cover the cost of reclamation for the anticipated time period required. This ensures that the mine, not the taxpayers, will pay for reclamation, even in the event of mine failure. See also the Response to Comment 2-11.

Letter 134

Mr. Greg Hallsten
Dept. of Environmental Quality
Impact Assessment Bureau
P.O. Box 200901
Helena, MT 59620-0901

RECEIVED
DEC 17 1997

Dear Mr. Hallsten

I am writing to you in support of Golden Sunlight's Proposed Action, found in the recently released Draft Environmental Impact Statement that reviews a proposed expansion of the mine in Whitehall, Montana.

I believe the Draft EIS provides a very thorough review of the alternatives and their respective Environmental Impacts.

I believe that the Water Management Plan and the mining plan have addressed ways that ensure that all Water Quality Standards are met or exceeded.

I also support GSM's application for a 404 permit from the Corps of Engineers, also GSM's willingness to comply with all 404 requirements

I work for GSM as a mill operator, I have a very high respect for the way GSM dealt with the environment from all aspects.

I've worked at GSM for 10 years, I have 3 kids (11, 8, 5) and a wife for 14 years. By working at GSM my wife can be a housewife, she sends the kids to school, also home when they get home. This is real important to me, I've lived here my whole life and want to raise my kids

Response to Letter 134

Thank you for your letter. No response necessary.

Letter 134 Continued

here. If GSM doesn't get the permit, my whole life will change. There's very little opportunity to stay in Montana and raise my kids the way we believe is proper.

In closing I urge you to issue the permit as quickly as possible to ensure the continued operation of GSM.

If GSM has to shut down because of the permit it goes far deeper than the 200+ employees. It hits all immediate towns, retailers everyone will be affected.

Sincerely

601 [illegible] Rd.
Whitehall, MT 59759

Response to Letter 134

Letter 135

Dear Mr. Hallsten

I'm writing this letter in support for Golden Sunlight Mine's operating Permit no. 00065. I also support Golden Sunlight Mine's Application for a 404 permit from the Corps of Engineers.

I feel the draft EIS. does a good job and provides a good technical analysis of the alternatives and environmental effects.

I feel if the mine's economical contributions to the State and Schools is lost, It's people like you and I who will have to make up the difference in cost.

I urge you to approve the final E.I.S. and issue the R.O.D. as soon as possible. Thank You

MERLE Olson
Box 381
Whitehall, MT
59759

RECEIVED
DEC 19 1997
[illegible]

Response to Letter 135

Thank you for your letter. No response necessary.

Letter 136

RECEIVED
DEC 22 1997
MT. DEPT OF ENV QUALITY
PERMITTING & COMPLIANCE DIV.

December 19, 1997

Dear Mr. Hallsten,

I am writing this letter in support of Golden Sunlight's Operating Permit. Golden Sunlight's past record involving water management, reclamation and environmental responsibility speaks for itself.

Delays in the EIS process could very well cause the State of Montana to lose an outstanding industry leader in Placer Dome. Denial of the Operating Permit would be a losing situation for all parties concerned. I urge DEQ and BLM to expedite the EIS process.

As a GSM employee with responsibilities assuring proper operation of waste dump seepage and ground/water protection, I can personally attest to and guarantee an unwavering commitment to environmental protection. Thank you.

Sincerely,

Tom Pala

Tom Palakovich
P.O. Box 237
Whitehall, MT 59759

Response to Letter 136

Thank you for your letter. No response necessary.

Letter 137

RECEIVED
JAN 21 1999

January 19, 1999

Greg Hallsten
Montana DEQ
PO Box 200901
Helena, MT 59620-0901

David Williams
Bureau of Land Management
PO Box 3388
Butte, MT 59702

Re: Golden Sunlight DEIS

Dear Greg and Dave,

137-1 The issue of pit backfilling has been treated in a very simplistic economic analysis. While this level of detail is more than adequate to dismiss the economic viability of backfill, several other important considerations seem to have been ignored. The socio-economic discussion mentions longer term employment resulting from backfill operations, but does not consider the economic impacts on the company (other than to indicate that no profit could be expected). Isn't it likely that a company required to operate for many years at a loss would go bankrupt or even more likely wouldn't even undertake the activity? Also, it should be noted that the fossil fuel and other resources committed to back fill would be considerable and would be "traded" for no environmental benefit.

Backfill would force closure of the Golden Sunlight mine and loss of the existing jobs and taxes as well as loss of the identified mineral resource. No water quality benefit or other tangible environmental benefit would be obtained. Aesthetic impacts would be associated with the increased period of post operation activities. Possibly the only difference would be a difference in visual impact from the air or the top of the highwall. The unbackfilled pit will provide unique visual, topographic and habitat aspects that would not be available with backfill. The area wide impact differential on wildlife habitat would be negligible. The company's off site habitat mitigation efforts should be included in the

288

Response to Letter 137

137-1 Comment noted. Please see the Responses to Comments 16-37 and 23-5.

Letter 137 Continued

137-1 analysis and credited with mitigating the slight effect the pit may have. I support the DEIS decision not to require backfill.

137-2 The mitigation required for migratory birds (WF-4 page 384) is not supported by law, policy or analysis in the DEIS. Impacts to individual members of populations that are not threatened or measurably impacted by the proposal does not warrant the prescribed mitigation.

The length of time to produce the DEIS has been substantial and the document is longer and more complicated than necessary. Please proceed with all haste to complete the final and grant the permits to allow Golden Sunlight to continue mining.

Sincerely,

Doug Parker

Douglas C Parker

Response to Letter 137

137-2 Comment noted. Please see the Response to Comment 23-2.

Letter 138

RECEIVED
DEC 15 1997

12-11-97

Mr. Greg Hallsten
Dept. of Environmental Quality
Impact Assessment Bureau
P.O. Box 200901
Helena, MT 59620-0901

Dear Mr. Hallsten:

I am writing to you in support of Golden Sunlight Mines Proposed Action, found in the recently released Draft Environmental Impact Statement that reviews a proposed expansion of their mine in Whitehall, MT.

I believe the Draft EIS provides a thorough review of the alternatives and their respective environmental effects. The EIS includes a comprehensive water management plan that provides sufficient contingencies to protect water resources and their downstream beneficial uses. Further, Appendix N also provides a good analysis that shows how Golden Sunlight will comply with Section 404 requirements.

I urge you to expedite the EIS process and to issue a final EIS as quickly as possible. Golden Sunlight's annual $10 million payroll supports 265

Response to Letter 138

Thank you for your letter. No response necessary.

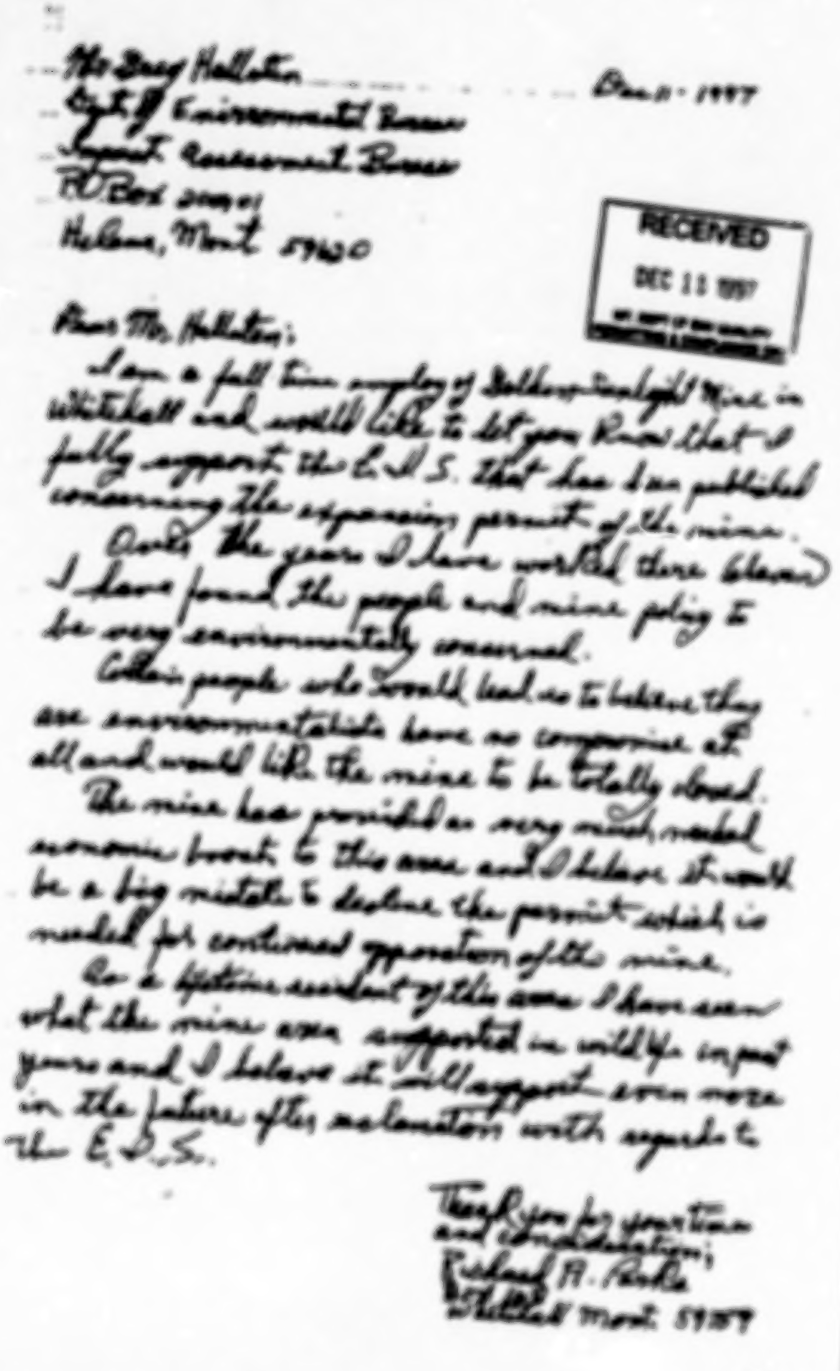
Letter 138 Continued

families" in my community directly, and generates another $21 million in economic activity through the purchase of goods and services. Further delays in the issuance of a Record of Decision undermine the operation's viability and the tremendous economic and social benefits the mine provides.

Sincerely,
Diane [illegible]
P.O. Box 168
Whitehall, MT 59759

Response to Letter 138

Letter 139



Mr Greg Hallsten
Dept of Environmental Bureau
Impact Assessment Bureau
P.O. Box 200901
Helena, Mont. 59620

Dec 8 - 1997

RECEIVED
DEC 11 1997

Dear Mr. Hallsten;

I am a full time employee of Golden Sunlight Mine in Whitehall and would like to let you know that I fully support the E.I.S. that has been published concerning the expansion permit of the mine.

During the years I have worked there (eleven) I have found the people and mine policy to be very environmentally concerned.

Certain people who would lead us to believe they are environmentalists have no compromise at all and would like the mine to be totally closed.

The mine has provided a very much needed economic boost to this area and I believe it would be a big mistake to decline the permit which is needed for continued operation of the mine.

As a lifetime resident of this area I have seen what the mine area supported in wildlife in past years and I believe it will support even more in the future after reclamation with regards to the E.I.S.

Thank you for your time and consideration,
Richard H. Parks
Whitehall Mont. 59759

Response to Letter 139

Thank you for your letter. No response necessary.

Letter 140

RECEIVED
DEC 16 1997

Dear Mr. [illegible]/Dear Mr. Williams

I am writing you to show my support in Golden Sunlight's Proposed Action in the EIS study recently released.

The mines water management plan and mining [illegible] analysis is very detailed and provide sufficient data that will thoroughly protect water quality.

140-1 Golden Sunlight's commitment to the environment has already been proven by their purchase of old site land for habitat preservation. Their reclamation plan already calls for reclaiming more than 2000 acres when mining is complete. Back filling the pit would provide very little environmental benefit and should not be considered.

Golden Sunlight is an important contributor to [illegible] economy. I urge you to expedite the EIS process and issue the mine all permits as quickly as possible so that mining operation can continue.

Sincerely,

John [illegible]

Response to Letter 140

140-1 Comment noted. Please see the Response to Comment 23-5.

Letter 141

RECEIVED
DEC 17 1997

December 9, 1997

Mr. Greg Hallsten
Montana DEQ
P.O. Box 200901
Helena, MT 59620-0901

Dear Mr. Hallsten:

I support the Proposed Action for the Draft Environmental Impact Statement, Golden Sunlight Mine. It accomplishes the most important objective of protecting the environment while allowing responsible development of the mineral resources of the area.

I urge you to enact the proposed action.

Sincerely,

Henry E. Reed

Response to Letter 141

Thank you for your letter. No response necessary.

Letter 142

Dear Mr. [illegible]

I am writing in support of Golden Sunlight's Proposed Action in the recently released Environmental Impact Statement. I believe the Draft EIS provides a thorough review of environmental effects. It is my belief that it has been thoroughly researched and will be just as thoroughly implemented. I live in the area and would not approve anything that I did not think was healthy for the environment in the area of which I live even if it were to cost me my job

Sincerely,

Tony Reid
1010 Lewisohn
Butte MT

RECEIVED
DEC 1 4 1997
[illegible]

Response to Letter 142

Thank you for your letter. No response necessary.

Letter 143

January 4, 1998

Mr. Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
P.O. Box 200901
Helena, MT. 59620

RECEIVED
JAN 06 1998
[illegible]

Dear Mr. Hallsten:

I am writing to you in support of Golden Sunlight Mine's proposed action as described in the EIS, which would allow continued and expanded operation of their mine in Whitehall, Montana.

After reviewing the draft EIS, I feel that it provides a thorough review of the alternatives and their respective environmental effects. I feel that it has a very comprehensive water management plan that will provide sufficient contingencies to protect water resources and their downstream uses.

143-1 On the issue of *Partial Pit Backfilling*, I see no environmental advantages vs. the *No Pit Pond Alternative*. I, too, do not want to see another Berkley Pit in Whitehall, Montana. If the mine wants to keep the pit pumped free of any water, I say let them do it. Golden Sunlight will be paying for the pumping and water treatment facility, not the state of Montana. After the water has been pumped from the pit, it will be treated where the local ranchers can then use it.

If Golden Sunlight Mine is forced to backfill their pit, then I can foresee this issue spreading to future mines in Montana and also gravel pits or any other open pit in Montana. This will discourage future developers from doing work in Montana. In turn, this will hurt Montana's economy.

I urge you to expedite the EIS process and to issue a final EIS as quickly as possible. Further delays in the issuance of a Record of Decision undermine the operation's viability and the tremendous economic and social benefit the mine provides.

Sincerely,

Chris D. Richardson

Chris D. Richardson

Response to Letter 143

143-1 Comment noted. Please see the Responses to Comments 16-37 and 23-5.

Letter 144

January 4, 1998

RECEIVED

JAN 26 1998

MT. DEPT OF ENV QUALITY
PERMITTING & COMPLIANCE DIV.

Mr. Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
P.O. Box 200901
Helena, MT. 59620

Dear Mr. Hallsten:

I am writing to you in support of Golden Sunlight Mine's proposed action as described in the EIS, which would allow continued and expanded operation of their mine in Whitehall, Montana.

I feel the draft Environmental Impact Statement provides a thorough review of the alternatives and their respective environmental effects. After reviewing the draft EIS, I feel that it has a very comprehensive water management plan that will provide sufficient contingencies to protect water resources and their downstream users.

As Chief Chemist of Golden Sunlight I am proud to say that we are very environmentally conscious. For example, a flock of migratory birds flew by and decided to land on our tailing impoundment. Security dispatched that anybody that could come to the tailings area should do so to help get rid of the birds before they become sick from drinking the water. As a result of this effort, no causalities were suffered. Today, a cyanide destruction plant has been constructed which will lower our tailings cyanide levels such that it will not be a threat to water fowl.

Golden Sunlight is proud of their mine and the surrounding area in which we hunt, fish, camp, and live. Why would we want to harm this beautiful area?

I urge you to expedite the EIS process and to issue a final EIS as quickly as possible. Golden Sunlight's annual income of $10 million supports 208 families in my community directly, and also generates another $21 million in economic activity through it's purchase of goods and services. Further delays in the issuance of a Record of Decision undermine the operation's viability and the tremendous economic and social benefit the mine provides.

Sincerely,

Ron Richardson

Ron Richardson
Chief Chemist - GSM

Response to Letter 144

Thank you for your letter. No response necessary.

Letter 145

December 31, 1997

Mr. Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
PO Box 200901
Helena, Montana 59620

RECEIVED
JAN 06 1998
MT. DEPT OF ENV QUALITY
PERMITTING & COMPLIANCE DIV.

Dear Mr. Hallsten:

I am writing to express my support for Golden Sunlight Mines expansion permit. The EIS draft does a thorough job addressing the environmental effects Golden Sunlight's continued mining will have on the surrounding water sources. Golden Sunlight's past water management, reclamation, and habitat preservation demonstrates their commitment to preserving and reclaiming the mine's surrounding environment.

Delays in approving the EIS will continue to negatively impact Golden Sunlight's operation. This not only impacts the mine but the community as well. Golden Sunlight provides 200 jobs and considerable tax revenue to Jefferson County and the State. I urge you to help expedite the Final EIS as quickly as possible. Thank you.

Sincerely, Marie F. Rider

Box 284
Whitehall, MT.
59759

Response to Letter 145

Thank you for your letter. No response necessary.

Letter 146

[redacted]

12-15-97

Mr Greg Hallsten
Dept of Environmental Quality
Impact Assessment Bureau
P.O. Box 200901
Helena, MT 59620

RECEIVED
DEC 22 '97

I am writing this letter to show my support of the Golden Sunlight Mine's preferred action as spelled out in the [illegible] [illegible] environmental impact study prepared by your agency and the Bureau of Land Management.

146-1 Partial backfilling of the pit appears to be a total waste. It does not provide more environmental benefit as water problems will have to be dealt with whether the pit is backfilled or not. In the long run it may be detrimental to backfill the pit as water in the bottom will leach the backfilled rock causing additional heavy metal problems.

The management plan and [illegible] [illegible] analysis prepared by the mine seems very adequate with all of todays technology.

Any further delays in the EIS will most certainly negatively impact the Golden Sunlight Mines operation. This will directly affect the jobs of more than 200 employees. In addition considering the job multiplier for a mine industry a slowdown or curtailment of operations will affect more than 1000 jobs in county

Response to Letter 146

146-1 Comment noted. Please see the Response to Comment 23-5.

Letter 146 Continued

The Whitehall [illegible] and surrounding [illegible], the mine [illegible] a substantial [illegible] in Jefferson County & the [illegible] District taxes along with paying the State [illegible] and [illegible] Gross Proceeds Taxes.

I have lived in Montana for 62 years, in the Whitehall area for 30 years and have worked for the Golden Sunlight Mine for 15 years. The mine has been an excellent employer and a very good asset to the Whitehall community. I am [illegible] hoping for them to [illegible] in Whitehall many more years.

[illegible] mining, timber, ranching, agriculture and all other good industries in Montana. We [illegible] not [illegible] on tourism and [illegible] a [illegible] with [illegible], although it does make this area a nice place to visit if you don't have to work for a living. All my children [illegible] and [illegible] in Montana and [illegible] have left the state to find work elsewhere due to the loss of good jobs here. Our largest and most important export from Montana is our children.

Sincerely
Richard Roberts
Richard Roberts
P.O. Box 445
Whitehall, MT 59759

Response to Letter 146

Letter 147

December 11,1997

Department of Environmental Quality
Impact Assessment Bureau
Attn: Mr. Greg Hallsten
P.O. Box 200901
Helena, Montana 59620

Dear Mr. Hallsten,

Please accept this letter as written support of Golden Sunlight Mine's Operating Permit No. 00065.

I feel the prepared E.I.S. draft is well done and answers to the issues with technical data regarding the environmental effects of this proposal.

Golden Sunlight Mines water management plan and Mixing *Zone method ensure* Water Quality Standards will be meet.

147-1 Partial Pit Backfill Alternative should not be considered . Water would still have to be handled and no benefit to wildlife habitat or air quality.Most important,pit backfilling would force the mine to close prematurely.

I would urge you to speed along the E.I.S. process and issue the ROD as quickly as possible so not to burden the profitibility of the mine,the work force, or the suppliers.

Sincerely,

Tom Ruark
3123 Phillips st
Butte, Mont. 59701

RECEIVED
DEC 11 1997
[illegible]

Response to Letter 147

147-1 Comment noted. Please see the Response to Comment 23-5.

Letter 148

RECEIVED
DEC 13 1997

Dear Mr Hallaton

Im writing to say that Im in support of Golden Sunlight Mines Proposed Action in the Environmental Impact Statement recently released by your department.

The mines water management plan and mixing zone analysis is very detailed and provides sufficient contingencies to reach above and beyond the safety measures required to protect water quality.

148-1 I don't think the partial back fill of the pit should be considered because I don't think it provides a environmental benefit. the water still has to be treated regardless. If this is installed the mine life will be shortened and put my self and many many others out of a job. For my family's sake and the sake of many other families please take careful consideration in this matter.

I believe G.S.M. commitment to the environment has already been demonstrated in the purchase of 4300 acres off site and leased 1800 acres off site for land and habitat preservation. Their reclamation plan already calls for the reclaiming of more than 2500 acres of site land when the mine eventually closes.

Response to Letter 148

148-1 Comment noted. Please see the Response to Comment 23-5.

Letter 148 Continued

I urge the DEQ and the BLM to expedite preparation of the Final EIS by incorporating the Draft EIS as is, so that the record of decision can be issued as soon as possible and Golden Sunlight can proceed with the expansion.

Sincerely
Ed [illegible]

Response to Letter 148

Letter 149

RECEIVED
DEC 16 1997

Mr. Greg Hallsten
MDEQ
P.O. Box 200901
Helena, MT 59620-0901

Dear Mr. Hallsten:

I am writing to you concerning the GSM draft EIS. it is a very through document that supplies ample information, that would state all potential impacts from the mine expansion. I am in full support of the GSM proposed action.

I also feel that that GSM's water management plan is also very safe.

As far as the reclamation is concerned I feel that GSM is going beyond what is sufficient, that land that is being reclaimed will have more vegetation after the reclamation than it did before it was even mined.

GSM has done more for this community and County than any other business around, without GSM the people in this town would probaly cease to exist. Putting 305 families on the welfare list. GSM supports the

Response to Letter 149

Thank you for your letter. No response necessary.

Letter 149 Continued

schools, with donations of computers and athletic equipment for our Children. They not only feed and clothe over 225 families that work for the mine, but support the whole community with their generosity, not to mention the taxes they pay in this state and county.

I am in full support of what ever GSM does. They are a very caring conscientious company, that cares about the people and the enviroment.

Any further delays in this EIS process will continue to negatively impact GSM's operation.

Please Urge DEQ and BLM to expedite the final EIS and issue the ROD as soon as posible.

We are counting on your cooperation and support. We need this statement done quickly so we can continue on with our day lives with out worrying about whether or not we will have a job next year or where we will possibly find one.

I believe Golden Sunlight commitment to the same enviroment has already been adequatly demonstrated. Sincerely Kay A. Ruckdaschel

Response to Letter 149

Letter 150

P.O. Drawer K
Twin Bridges, Montana 59754

January 17, 1998

RECEIVED
JAN 21 1998

Mr. Greg Hallsten
Montana Department of Environmental Quality
P.O. Box 200901
Helena, Montana 59620-0901

Dear Mr. Hallsten:

I would like to add my support to the Golden Sunlight Mine Proposed Action in the recently released Draft Environmental Impact Statement.

Golden Sunlight has been a good neighbor in southwest Montana. The company contributes generously to community projects throughout the region, both in financial support, and in materials and other support. Its purchases in goods and services exceed $27 million each year--most of this in southwest Montana. Given the multipliers that measure how much and how long such expenditures benefit the region, the company clearly is one of the principal economic contributors to the region. And this not even considering the taxes paid, which support school and a host of State and local government services. The annual payroll of $10 million supports 205 families, and again, each of those dollars goes through several businesses before it leaves the region. And these social and economic concerns certainly are appropriate parts of any environmental impact statement.

The company has demonstrated its commitment to the environment as well, with purchases of land to preserve wildlife habitat near the mine site, with its leading work on the reclamation of steep slopes, and with its commitment to reclaim the mine area when mining is complete. The mine water management plan and mixing zone analysis is detailed and exceeds what is required to protect water quality. And the company makes every effort to keep current information available to anyone who requests it.

I would urge that that the Final Environmental Impact Statement incorporate the Draft Statement as is, and that the record of decision be issued promptly so that the Golden Sunlight Mine can proceed with its planned expansion.

Sincerely yours,

Edward T. Ruppel
Geologist

Response to Letter 150

- Thank you for your letter. No response necessary.

BLANK

PAGE

Letter 151

84 Montana Hwy. 2 West
P.O. Box 263
Whitehall, Montana 59759

RECEIVED
[illegible]
MT. DEPT OF ENV QUALITY
PERMITTING & COMPLIANCE DIV

December 19, 1997

Mr. Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
P.O. Box 200901
Helena, Montana 59620

Re: Golden Sunlight Mine(GSM) Draft Environmental Impact Statement(DEIS)

Dear Mr. Hallsten
I have reviewed the GSM DEIS extensively and have concluded that the company should have a record of decision for mine expansion coincident with the preferred alternative because:

- The document addressed all technical issues completely.
- Water quality in the surrounding area will be protected with a good water management plan and mixing zone analysis, which protects beneficial uses.
- Technical research/analysis has demonstrated that reclamation of waste rock and tailing surfaces will be successful to minimize water infiltration, ARD generation, and erosion.

151-1 I believe the agencies made the correct determination that partial pit backfilling would have minimal environmental benefits and a drastic economic consequence of mine shut down.

Please consider these comments for your record of decision.

Sincerely,

Darrell Scharf
Darrell Scharf

Response to Letter 151

151-1 Comment noted. Please see the Response to Comment 23-5.

Letter 152

Dear Mr. Hallsten,

I support the Golden Sunlight Mine's effort to attain a new operating permit through the EIS process. This process has been going on for the better part of two years. The EA process, and now the EIS process. I think the draft EIS covers in in depth, areas of all problems and potential problems of the mine expansion.

Golden Sunlight is committed to a clean environment, to the work force, and to the neighboring communities. It has a proven track record as a good neighbor and I think it deserves passage of the EIS.

I hope you will do all in your power to expedite the process.

Thanks for your consideration
Sincerely

108 South Montana St.
Butte, MT
59701

RECEIVED
DEC 15 1997

Response to Letter 152

Thank you for your letter. No response necessary.

Letter 153

RECEIVED

JAN 0 5 1998

Paul Seccomb
108 South Montana
Butte, MT 59701

January 5, 1998

Montana Department of Environmental Quality
Impact Assessment Bureau
P.O. Box 200901
Helena, MT 59620-0901
Attention: Greg Hallsten

Dear Mr. Hallsten:

My wife and I live in Butte and I am a mill operator at Golden Sunlight Mine have been for the past 10 years. I was born in Montana and have lived here almost 40 years. My dad retired from Golden Sunlight Mine and my brother also works there.

Water quality is important to people everywhere and it is not any different here in Montana or in Jefferson County. Opponents of mining flash pictures of the Berkley Pit or the old Mike Horse Mine on our TV screen, in their publications and on posters to illustrate their point that past practices have led to ugly pictures. What is interesting to note however, is that Golden Sunlight Mine has always been committed to ensuring that the water quality is protected on their mine site. They committed to treating the water that may cause environmental impacts on their site long ago and continue to guarantee the people of this state that this issue is extremely important to them. They have committed to building a water treatment facility and have posted a bond with the State of Montana to guarantee that even after reclamation of the mine site is complete, the money will be there to ensure that water is treated. That is good corporate stewardship and it should be expected of Golden Sunlight or for that matter, anyone else who wants to mine in this state or anywhere.

Response to Letter 153

Letter 153 Continued

Still that doesn't seem to be enough to satisfy our critics. Backfilling of the open pit at Golden Sunlight Mine is, and has been, an issue with those who do not like what we do here. I don't know that anything short of shutting this mine down or a complete backfilling of the pit will satisfy them. Mandatory backfilling of open pits was never the intention of this state and it still isn't. However, according to the Metal Mine Reclamation Act, *When mining has left an open pit exceeding 2 acres of surface area and the composition of the floor or walls of the pit are likely to cause formation of acid, toxic, or otherwise pollutive solutions on exposure to moisture, the reclamation plan must include provisions that adequately provide for: (b) processing of any objectionable effluents in the pit before they are allowed to flow or be pumped out of the pit to reduce toxic or their objectionable ratios to a level considered safe to humans and the environment by the board.* It also goes on to say that a *mine reclamation plan must provide sufficient measures to ensure public safety and to prevent the pollution of air or water and the degradation of adjacent lands.*

153-1

The EIS states, on pages 296-297 of Chapter 4 which is the section on Water Resources, that under Golden Sunlight's proposed action or the partial backfilling alternative, water quality will be poor and that pumping and treatment of the water will be necessary and that "impacts are expected to be similar to those for the Proposed Action..." both in terms of impacts to springs from pit dewatering and in the amount of water reporting to the permanent water treatment plant.

In other words, partially backfilling the pit does nothing to enhance the water quality. I would like the *Summary* to include that information in its summary of the partial pit backfilling alternative and the reasons for not choosing that alternative as part of the agency's preferred alternative.

Sincerely,

Paul Seccomb

Response to Letter 153

153-1 Comment noted. Please see the Responses to Comments 16-37 and 23-5.

Letter 154

December 11, 1997

Dear Sir,

Thank you for the opportunity to tell you my side of the story. Golden Sunlight Mine has helped me buy a home in Montana, buy cars and trucks from Montana dealers, and educate my children in Montana Colleges and Universitys.

I feel that the land in our state should be managed by the people who live here and work here. We care about Montana and we have learned to use, not abuse the land and make a good living from it. I have been in this state for all of my 45 years. I believe that Golden Sunlight Mine should be granted this permit and allowed to finish their operation and reclaim the land to specifications already set by law.

RECEIVED
DEC 16 1997
[illegible]

Thank You,

Ricky R Sharkey

Rickey R. Sharkey
404 1st St. E.
Whitehall, Mt. 59759

Response to Letter 154

Thank you for your letter. No response necessary.

Letter 155

Mr. Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
P.O. Box 200901
Helena, MT 59620

RECEIVED
JAN 05 1998
[illegible]

Dear Mr. Hallsten

I am writing to you in support of the expansion of the Golden Sunlight Mine in Whitehall, MT. However the process in which the mine gets permits to operate is taking longer than anticipated. The mine has proven it's commitment to reclamation and environmental protection and should continue to operate for the next several years.

My family as well as many others depend on this mine for our financial survival, and would be devastated if it were to not get it's permit now. I have just started college, I have 3 children and a new home and I would not have any of this if it were not for the mine. I get no kind of financial aid or help of any kind for college and I depend on my husband's job to pay my way so when the mine does close, we will have an alternative job to support our family.

Please don't let the few good paying jobs this state does have disappear. A lot of families and communities are depending on this.

Sincerely,

Charlene Sholey

Charlene Sholey
P.O. Box 7
Ramsay, MT
59748

3/2

Response to Letter 155

155-1 Thank you for your letter. No response necessary.

Letter 156

January 15, 1998

RECEIVED

JAN 21 1998

Mr. Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
P.O. Box 200901
Helena, Mt. 59620

Mr. Dave Williams
BLM - Butte District
Headwaters Resource Area
P.O. Box 59702
Butte, Mt. 59702

Dear Mr. Hallsten/Dear Mr. Williams:

Please accept this letter as written support of Golden Sunlight Mine's Operating Permit No. 00065.

The Draft EIS thoroughly analyzes the alternatives and environmental effects of mine expansion.

Golden Sunlight, in the past has demonstrated good corporate citizenship by providing several thousand acres of wildlife habitat. The company has demonstrated a strong commitment to protect the environment. This is shown by the way it responds to environmental concerns.

I also support Golden Sunlight's application for a 404 permit from the Corps of Engineers.

Golden Sunlights's economic contributions to the State of Montana, local school districts and surrounding communities is substantial. I urge you to approve the final EIS and issue the ROD as soon as possible.

Sincerely;

Earl Sholey Jr.

Earl Sholey Jr. Resident of Jefferson County
230 Frenich Lane
Whitehall, Mt. 59759

Response to Letter 156

156-1 Thank you for your letter. No response necessary.

Letter 157

Dear Mr. Hellstrom

I am writing to you in support of Golden Sunlight Mine's proposed action as described in the EIS, which would allow continued & expanded operation of this mine in Whitehall MT.

I believe the draft EIS does a thorough job & provides a high level of technical analysis of alternatives & environmental effects.

I support GSM water management as they were detailed & well conceived. I support GSM mining area analysis. I support GSM application for Section 404 permit from U.S. Army Corps of Engineers.

157-1 I don't believe in Partial Backfill Alternative. Backfilling the pit will have little environmental benefit. Water will still have to be handled with or without backfilling & there would be no improvement to wildlife habitat or air quality. Most importantly, pit backfilling will force the mine to close prematurely like the No Action Alternative.

As one of the 250 employees of Golden Sunlight I can attest to the Mine's commitment to reclamation & habitat preservation. The EIS clearly demonstrates that Golden Sunlight will comply with all sections of the 404 requirements. I urge you to expedite the EIS process & to issue a final EIS as quickly as possible.

Sincerely Frank Shirley

Frank Shirley

[illegible]
Ramsey MT 59748

RECEIVED
DEC 18 1997
[illegible]

Response to Letter 157

157-1 Comment noted. Please see the Response to Comment 23-5.

Letter 163 Continued

-2-

with confidence, having been directly involved with measures already completed to protect the waters of the U.S.

Response to Letter 163

Letter 158

Dear Mr. Hallsten

I am writing to support the Golden Sunlight Mines Proposed Action. I believe that Golden Sunlight has good management. Mine is protecting water and wild life.

I hope that the EIS will go through quickly. There are alot of families counting on it. Delays in the EIS will Effect everybody in the Community.

Sincerely, Larry D. Smith

RECEIVED
DEC 15 1997

Response to Letter 158

Thank you for your letter. No response necessary.

Letter 159

RECEIVED
DEC 16 1997

Dear Mr. Hallsten

I am writing in support of Golden Sunlight Mine Proposal on the released Draft Environmental Impact Statement of a proposed expansion of the mine in Whitehall, Montana.

I believe the draft provides for water management, environmental issues, water resources & down stream uses.

Hope you will issue a final EIS as soon as possible as the Golden Sunlight Mine is an asset to the community & many families too.

Sincerely,
Clive L. Smith

Response to Letter 159

Thank you for your letter. No response necessary.

Letter 160

Dear Mr Hallston

I am writing to you about the Draft Environmental Impact Statement that reviews a proposed expansion at the Golden Sunlight Mine in Whitehall

The EIS includes a comprehensive water management plan and plans to protect water resources and downstream users.

I support the Golden Sunlight Mine's Draft Environmental Impact Statement.

Sincerely
Paul Smith

RECEIVED
DEC 15 1997

Response to Letter 160

Thank you for your letter. No response necessary.

Letter 161

RECEIVED
DEC 16 1997

TO MR. GREG HALLSTEN
DEPT. OF ENVIRONMENTAL BUREAU
IMPACT ASSESSMENT BUREAU
P.O. BOX 200901
HELENA, MONTANA 59620

FROM: RICHARD A. SMITH AND FAMILY
BOX 189
WHITEHALL, MONTANA
59759-0189

I AM WRITING THIS LETTER TO SHOW MY SUPPORT FOR THE GOLDEN SUNLIGHT MINE AND THE EIS PERMIT. I HOPE THAT IN REVIEWING THE PUBIC COMMENTS, THAT YOU LOOK STRONGLY AT THE PERSONAL AS WELL AS THE ENVIRONMENTAL SIDES OF THIS ISSUE. TO ME THEY ARE ONE IN THE SAME.

YES, I WORK AT THE GOLDEN SUNLIGHT MINE AS DO MANY OF MY FRIENDS. WE DO LIVE, WORK AND PLAY IN MONTANA, AND WE DO PAY TAXES. SPEAKING FOR MY SELF, I WAS BORN AND RAISED IN WHITEHALL. I DO CARE ABOUT MY ENVIRONMENT, BECAUSE IT IS MY ENVIRONMENT AND THAT OF MY FAMILY. UNLIKE MANY OF THE GROUPS THAT FIGHT THE VERY EXISTENCE MINING IN OUR STATE, I LIVE IN AN AREA THAT MINING HAS INFLUENCED FOR YEARS, ENVIRONMENTALLY AND ECONOMICALLY.

AS A NATIVE TO THE WHITEHALL AREA AND AN EMPLOYEE OF THE GOLDEN SUNLIGHT MINE, I FEEL THAT GSM IS DOING AN EXCELLENT JOB PROTECTING MY ENVIRONMENT AND THAT OF THE AREA AROUND THE MINE SITE. 161-1 I FEEL THAT THE PIT BACK FILLING ISSUE IS ECONOMICALLY INFEASIBLE AND IS ANOTHER ENVIRONMENTALIST TACTIC TO HINDER AND DELAY FURTHER THE PERMITTING PROCESS.

MY FAMILY AND I GIVE OUR FULL SUPPORT OF THE EIS AND TO THE GOLDEN SUNLIGHT MINE IN THE PERMITTING PROCESS.

YOURS TRULY,
Richard A. Smith
RICHARD A. SMITH

Response to Letter 161

161-1 Comment noted. Please see the Response to Comment 23-5.

Letter 162

January 12, 1998

Greg Hallsten,
MT Dept of Environmental Quality
P.O. Box 200901
Helena, MT 59620-0901

RECEIVED
JAN 13 1998

Re: Expansion permit for Golden Sunlight Mine (GSM)

After reading the summary of the draft EIS on the GSM expansion, attending the public meeting in Whitehall and talking to a large number of people, I support the proposed plan along with alternatives 3 and 6. Alternative 6, with the continuous pumping and treatment of collected water in the pit, is more [illegible] hazard and also leaves open an option for future mining. 162-1 This option should not be foreclosed. The mine is a reality and should be dealt with as such. Worker safety in backfilling is also an issue.

GSM is a responsible company that is acting in good faith and following the law - including the [illegible] stipulations as required in the 1990 Settlement Agreement. As long as GSM continues to meet all its obligations under the law and to post fully adequate bonding for reclamation, the expansion permit should be approved. Delay is costly and [illegible] unsettling for GSM, the workers, and the community.

Glen E. Stoll
P.O. Box 494
Whitehall, MT 59759

Phone: (406) 287-5799

Response to Letter 162

162-1 Comment noted. Please see the Response to Comment 23-5.

Letter 163

January 16, 1998

Mr. Greg Hallsten
Dept. of Environmental Quality
Impact Assessment Section
P.O. Box 200901
Helena, MT 59620

RECEIVED
JAN 21 1998

Dear Mr. Hallsten:

I am writing you to express my support of Golden Sunlight Mine's Proposed Action contained in the Environmental Impact Study.

The Draft EIS is a thorough document which contains a high level of technical information, derived from countless studies and hours of effort, and deliberation by many people.

I believe that the Water Management Plan and Mixing Zone analysis prepared by GSM will protect down-stream water users. I am also confident that GSM will comply with all conditions of the 404 permit which has been applied for from the Army Corps of Engineers. I say this

Response to Letter 163

Letter 163 Continued

-2-

with confidence, having been directly involved with measures already completed to protect the waters of the U.S.

163-1 Measure WF-4 protecting bird nesting habitat by avoidance is unrealistic. With it, the mine could not maintain continuity of operations. I believe the efforts GSM has made to provide several thousand acres of potential nesting habitat, will not only propagate and support many bird species, but many other animal species as well.

163-2 I agree that the partial pit backfill alternative should not be considered since it would provide very little environmental benefit, and would obviously place a huge economic strain on the company.

The economic contributions realized from the mine's presence are significant, and cannot easily be replaced. The 200 plus employees at GSM work and perform their

Response to Letter 163

163-1 Comment noted. Please see the Response to Comment 23-2.

163-2 Comment noted. Please see the Response to Comment 23-5.

Letter 164

RECEIVED
DEC 16 1997

Mr. Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
P O Box 200901
Helena, Montana 59620

Dear Mr. Hallsten

I am writing in support of Golden Sunlight Mine's Operating Permit No. 00065 which would allow them to continue their mine in Whitehall, Montana.

I believe that this draft EIS is well prepared and provides all the information needed to evaluate the potential impacts of the mine's expansion.

As one of Golden Sunlight's employees I have seen their commitment to reclamation and habitat preservation. This EIS demonstrates that Golden Sunlight will comply with all sections of the 404 requirements.

I urge you to help hurry the EIS process and issue a final EIS as quickly as possible.

Sincerely,

Response to Letter 164

Thank you for your letter. No response necessary.

Letter 165

John J. Tomich
2245 Skyway Avenue
Butte, MT 59701

December 12, 1997

RECEIVED
DEC 19 1997
MT. DEPT OF ENV QUALITY
PERMITTING & COMPLIANCE DIV

Mr. Greg Hallsten
Dept. of Environmental Quality
Impact Assessment Bureau
P.O. Box 200901
Helena, MT 59620

Dear Mr. Hallsten,

As a current employee of Golden Sunlight Mine, and a native and life-long resident of Montana, I have over 11 years of experience working in the mining industry. I believe in environmental protection, but it must be fair and balanced, to allow for some economic development. Regarding GSM's EIS, I strongly urge you to accept the Proposed Action.

Requiring GSM to partially backfill the pit would not only be economically unfeasible, but may set a precedent which could prevent any future mining in the State of Montana. If GSM is required to pump and treat water to prevent ponding in the bottom of the pit, there is no advantage to backfilling also.

165-1 GSM has proven that they can successfully revegetate and prevent erosion on slopes as steep as 2:1. GSM has conducted a five-year study on waste rock piles to determine optimum slope angles and capping materials to minimize erosion and water infiltration.

165-2 The Sheep Rock Creek and Conrow Creek drainages are normally almost dry. Diverting the Sheep Rock Creek drainage should pose no significant threat to the environment, and the Return Diversion Alternative should not be considered in the final EIS.

165-3 The use of "avoidance" as a mitigation measure to protect bird nesting habitat is unrealistic and could severely impact GSM's soil salvage efforts during the spring and early summer. GSM has provided for the preservation of wildlife habitat both on and off-site, which provides sufficient replacement habitat for birds.

The Water Management Plan and Mixing Zone Analysis will ensure that Water Quality Standards are followed. GSM has demonstrated a willingness to comply with all 404 requirements, and I urge you to support the permit application from the Army Corps of Engineers.

I ask that you expedite the EIS process as quickly as possible. The economic livelihood of 210 employees, as well as that of all Southwestern Montana, is at stake.

Sincerely,

John J. Tomich
Project Metallurgist
Golden Sunlight Mines, Inc.

Response to Letter 165

165-1 Comment noted. Please see the Response to Comment 23-5.

165-2 Comment noted. Please see the Response to Comment 72-2.

165-3 Comment noted. Please see the Response to Comment 23-2.

Letter 166

Dear Mr. Hallsten,

I'm writing in support of Golden Sunlight Proposed Action. I believe the Draft EIS shows good things for the environment. GSM has always shown great concern for its environment & surrounding areas.

I feel if this EIS does not go through it will have bad effects on the economy of the community.

Sincerely,

Travis J. Trout

RECEIVED
DEC 15 1997
[illegible]

Response to Letter 166

Thank you for your letter. No response necessary.

Letter 167

Whitehall, MT.
January 4. 1998

RECEIVED
JAN [illegible] 1998

Mr. Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
P. O. Box 200901
Helena, MT 59620

Dear Mr Hallsten,

I am writing to you in support of the Golden Sunlight Mine's proposed action as described in the EIS, which would allow continued and expanded operation of their mine in Whitehall, Montana.

I believe the draft Environmental Statement provides a thorough review of the alternatives and their respective environmental effects. The EIS includes a comprehensive water management plan that provides sufficient contingencies to protect water resources and their downstream beneficial uses.

As a taxpayer in the Whitehall area & the parents of a worker at the Golden Sunlight Mine we are very aware of the mines commitment to reclamation and habitat preservation. The EIS clearly demonstrates that Golden Sunlight will comply with all section of the 404 requirements.

I urge you to expedite the EIS process and to issue a final EIS as quickly as possible. Golden Sunlight's annual $10 million payroll supports 208 families in my community directly, and generates another $21 million in economic activity through it's purchases of goods and services. Further delays in the issuance of a Record of Decision undermine the operation's viability and the tremendous economic and social benefit the mine provides.

Sincerely

Miles & Doloris Tuttle

Response to Letter 167

Thank you for your letter. No response necessary.

Letter 168

RECEIVED
DEC 17 '97

December 15, 1997

Mr. Greg Hallsten
Depart. Of Environmental Quality
P.O. Box 200901
Helena, MT 59620

Dear Mr. Hallsten:

I am writing to you in support of Golden Sunlight Mine's proposed action as described in the EIS, which would allow continued and expanded operation of their mine in Whitehall, MT.

168-1 I do not support the Partial Pit Backfill Alternative, there would be no additional benefit to wildlife habitat or air quality. As an employee of Golden Sunlight Mine I have seen more wildlife on this mine site than I have in the surrounding mountains. They have thrived in this environment. Golden Sunlight takes every measure to protect the wildlife, the reclamation that they have already done has added to the environmental quality and wildlife habitat.

Delays in the EIS process has and will continue to negatively impact GSM's operation. I urge DEQ and BLM to expedite the Final EIS and issue the ROD as quickly as possible. The Draft EIS should be incorporated as is into the Final EIS.

Please put people back into the equation.

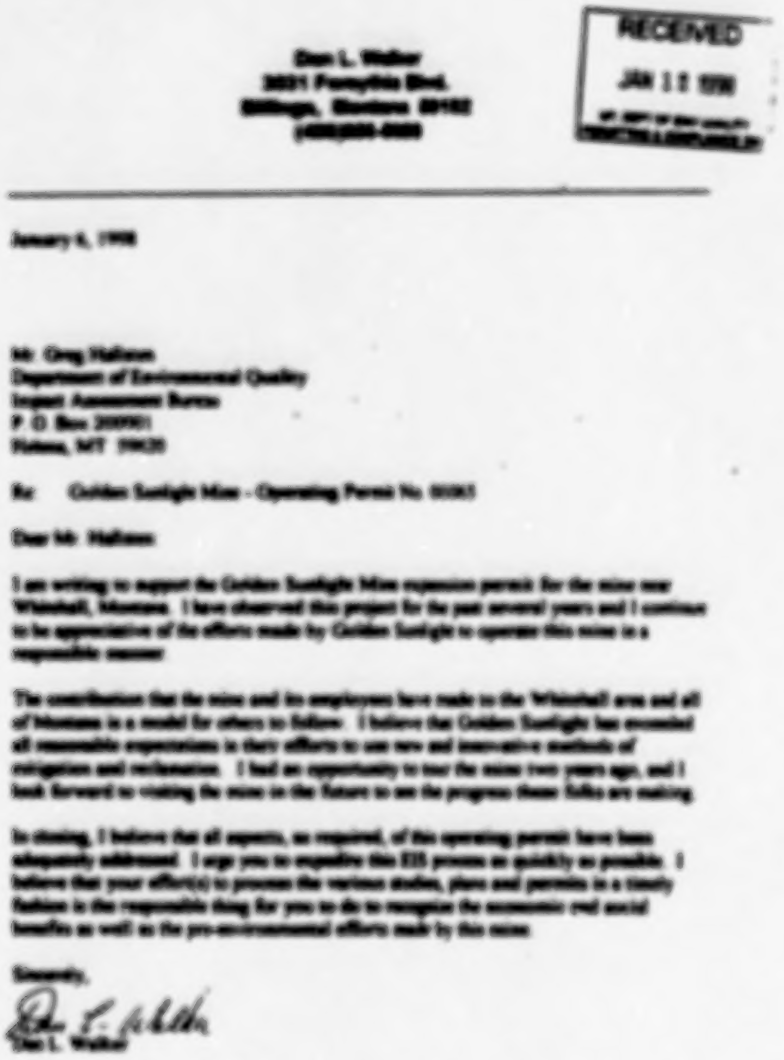
Sincerely,

Sharel Uphus
P.O. Box 857
Whitehall, MT 59759

Response to Letter 168

168-1 Comment noted. Please see the Response to Comment 23-5.

Letter 169



Dan L. Walker
3021 Forsythia Blvd.
Billings, Montana 59102
(406)[illegible]

RECEIVED
JAN 12 1998
[illegible]

January 6, 1998

Mr. Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
P. O. Box 200901
Helena, MT 59620

Re: Golden Sunlight Mine - Operating Permit No. 00065

Dear Mr. Hallsten:

I am writing to support the Golden Sunlight Mine expansion permit for the mine near Whitehall, Montana. I have observed this project for the past several years and I continue to be appreciative of the efforts made by Golden Sunlight to operate this mine in a responsible manner.

The contribution that the mine and its employees have made to the Whitehall area and all of Montana is a model for others to follow. I believe that Golden Sunlight has exceeded all reasonable expectations in their efforts to use new and innovative methods of mitigation and reclamation. I had an opportunity to tour the mine two years ago, and I look forward to visiting the mine in the future to see the progress these folks are making.

In closing, I believe that all aspects, as required, of this operating permit have been adequately addressed. I urge you to expedite this EIS process as quickly as possible. I believe that your effort(s) to process the various studies, plans and permits in a timely fashion is the responsible thing for you to do to recognize the economic and social benefits as well as the pro-environmental efforts made by this mine.

Sincerely,

Dan L. Walker

Response to Letter 169

Thank you for your letter. No response necessary.

Letter 170

Sir:

I would hope your agency will Get Golden Sunlights Eis approved soon. If You allow Enviro's To shut down Every Company that Pays Good wages that means less Taxes to Government and when I last looked your Agency is part of The Government so maybe some of you might be Getting the ax Too

Thanks
[illegible] (Tax Payer)

RECEIVED
DEC 18 1997
[illegible]

Response to Letter 170

Thank you for your letter. No response necessary.

Letter 171

12-11-97

Mr. Greg Hallsten
MDEQ
PO Box 200901
Helena, MT 59620-0901

RECEIVED
DEC 15 1997

Re: GSM EIS

Dear Mr. Hallsten:

The GSM Draft EIS has been through the hands of "experts". All issues have been addressed and I am confident that these experts have the technical Knowledge needed to make decisions that would affect my environment, my grandchildren's environment, and their grandchildren's environment.

Why would anyone make a bad decision that would affect their own health, just for money? The experts at GSM are in a position to judge whether or not the proposed action is safe. But environmentalists are not. They don't have any technical training, or if they do, they have been swayed by other influences.

Response to Letter 171

Thank you for your letter. No response necessary.

Letter 171 Continued

Please expedite the Final EIS using the Draft EIS as it is.

thank you for your consideration.

Sincerely,

207 2nd W.
Whitehall, MT. 59759

Response to Letter 171

Letter 172

RECEIVED
DEC 18 1997

Mr. Greg Hallsten
Dept. of Environmental Quality
Impact Assessment Bureau
P.O. Box 200901
Helena, MT 59620

Dr. Mr. Hallsten,

I am writing in regards to the Golden Sunlight Mine and the proposals in the EIS to allow continued and expanded operation of our mine in Whitehall, MT.

I believe the Golden Sunlight Mines commitment to the environmental effects and waste management mitigation, through much time and review, stated in their EIS.

I am employed at GSM along with some 200 other employees and can attest to the mines integrity to comply with all requirements for reclamation and preservation.

GSM's payroll supports 200 families in Whitehall and generates millions in the economy of our state, with that I would please urge you to issue a final EIS as soon as possible. Our future and the stability of our families rely on whether or not the mine will be able to continue to remain in operation.

I feel the mine has done all they can to show that the mining industry can operate and also be environmentally responsible.

Sincerely,
Kerry [illegible]

Response to Letter 172

Thank you for your letter. No response necessary.

Letter 173

12-11-97

Mr. Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
P.O. Box 200901
Helena, MT 59620

RECEIVED
DEC 15 1997
[illegible]

Dear Mr. Hallsten

I am writing to you in support of Golden Sunlight Mine's proposed action as described in the EIS, which would allow continued and expanded operation of their mine in Whitehall, Montana.

Draft EIS does a thorough job and provides a high level of technical analysis of alternatives and environmental effects.

I fully support GSM's proposed action and will reclaim over 2,500 acres when mining is completed. They also have purchased over 4,300 acres of off-site land and lease an additional 1,900 acres of offsite land to preserve open space and wildlife habitat around
173-1 the mine site. Requiring GSM to backfill their open pit just to cover 235 acres of pit highwall is absurd.

Delays in EIS process has and will continue to negatively impact GSM's operation. Urge DEQ and BLM to expedite the final EIS and issue the ROD as quickly as possible. The draft EIS should be incorporated as is into the final EIS.

Sincerely,

Response to Letter 173

173-1 Comment noted. Please see the Responses to Comments 16-37 and 23-5.

Letter 174

DEC. 12, 1997

Mr. Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
P.O. Box 200901
Helena, MT 59620-0901

RECEIVED
DEC 15 1997

Dear Mr. Hallsten:

I am writing to you in support of Golden Sunlight Mine's proposed action, found in the recently released Draft Environmental Impact Statement that reviews a proposed expansion of their mine in Whitehall, Montana.

174-1 I believe the Draft EIS is good. Backfilling the pit, like some groups are demanding, is not feasible, and probably not possible, and is an effort to stop mining in Montana.

I ask that you stand firm with the Draft EIS and finalize this situation.

My job and hundreds of others are on the line.

Sincerely,

Doug House
Box 557
Pony, MT.
59747

Response to Letter 174

174-1 Comment noted. Please see the Response to Comment 23-5.

Letter 175

#51

EXPLORATION

LARRY G. YOUNG
P.O. Box 283
Pony, Montana
59747

(406)685-3387

RECEIVED
DEC 14 1997

To
Personal of the agencies of the Montana DEQ, BLM, USEPA, Montana DNRC and Army Corps of Engineers.

Dear Participants:

It has been brought to my attention and it is a concern to me the delays the Golden Sunlight Mine has been subject to concerning receiving their Operating Permit #00065

Being a resident of Montana for forty years and being actively involved in all phases of the mineral industry, I have observed the practices at the Golden Sunlight Mine from the beginning of development to the present and have found their performance to be outstanding.

The Golden Sunlight Mines opration and reclamation practices deserve an A+, There is no question they have improved wildlife habitat and have a great concern for it.

I have read the complete Draft Environmental Impact Statement. I do agree with Golden Sunlight's
175-1 [view concerning Elk-to [illegible] in the DEIS. & "avoidance" from May through July being unrealistic.]
I believe the Golden Sunlight Mine has addressed all issues adequately.

I would support no further delays in the EIS process and urge you to expedite this EIS process as soon as possible

Sincerely
Larry G. Young

Response to Letter 175

175-1 Comment noted. Please see the Response to Comment 23-2.

Letter 176

RECEIVED
JAN 08 1998
MT. DEPT OF ENV QUALITY

December 28, 1997

Mr. Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
PO Box 200901
Helena, Montana 59620

Dear Mr. Hallsten:

I support Golden Sunlight Mines expansion permit. I believe the draft EIS thoroughly addresses all the environmental effects the mine's continued operation would have on the surrounding water sources and animal habitat.

Golden Sunlight Mines has demonstrated it is an environmentally responsible company and will comply with all Montana's DEQ regulations.

Please issue a final EIS. Let the mine continue to provide jobs, pay taxes, and support our local schools. I see no reason for the state of Montana to deny Golden Sunlight their expansion permit. Thank you.

Sincerely,

Box 354
Whitehall MT
59759

Response to Letter 176

Thank you for your letter. No response necessary.

Letter 177

Michael W. Madden
712 Cedar
Anaconda, MT 59711-3038

December 17, 1997

Mr. Greg Hallsten
Dept. of Environmental Quality
Impact Assessment Bureau
P.O. Box 200901
Helena, MT 59620

RECEIVED
[illegible]
MT DEPT OF ENV QUALITY
PERMITTING & COMPLIANCE DIV.

Dear Mr. Hallsten:

Re: Draft Environmental Impact Statement - Golden Sunlight Mines, Inc.

The Draft EIS with respect to the Golden Sunlight Mines operations and expansion plans does a thorough job and provides a high degree of technical analysis of alternatives and environmental effects.

I am personally supportive of Golden Sunlight Mines water management plan. It is detailed, well conceived and provides intelligent contingencies that more than address the protection of water resources.

177-1 Golden Sunlight Mines, Inc. is a commendable guardian of our natural resources and I am confident will continue in this manner through the duration of their mining operations. It is proven that pit backfilling, partial or otherwise, is of no consequence to water protection, wildlife habitat or air quality.

Golden Sunlight is, as well, a substantial contributor to the economy of Montana. It provides tremendous support of the surrounding communities including Anaconda. I encourage you to quickly advance the EIS process and issue the *Record of Decision* as quickly as possible so that Golden Sunlight can continue its most worthy operations.

Yours very truly,

Michael W. Madden

Response to Letter 177

177-1 Comment noted. Please see the Response to Comment 23-5.

Letter 178

December 12, 1997

Mr. Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
P.O. Box 200901
Helena, Montana 59620

RECEIVED
DEC 15 '97

Dear Mr. Hallsten:

As a concerned member of one of the communities surrounding the Golden Sunlight Mine, I am writing to support the GSM Proposed Action in the recently released Draft Environmental Impact Statement.

Golden Sunlight is a major economic contributor to my community, purchasing more than $21 million in goods and services annually. Their annual payroll of $10 million supports 205 families and the businesses these families patronize. In addition to this economic importance, Golden Sunlight contributes significantly to the area's social well being, through donations and support of community projects.

The mine has continually demonstrated its commitment to environmental protection with its land purchases to preserve and develop wildlife habitat around the mine site, as well as its pioneering work in steep slope reclamation. Golden Sunlight will reclaim more than 2,500 acres when mining is complete. The mine's water management plan and mixing zone analysis is very detailed and goes above and beyond what is required to protect
178-1 water quality. The partial pit backfill alternative should not be considered since it will do little to improve what is already a thorough and well-thought out reclamation plan.

I urge you to expedite preparation of the Final EIS by incorporating the Draft EIS as is, so that the record of decision can be issued as soon as possible and Golden Sunlight can proceed with its expansion.

Sincerely,

Edna Lutey

Response to Letter 178

178-1 Comment noted. Please see the Response to Comment 23-5.

Letter 179

RECEIVED
JAN 14 1998
MT DEPT OF ENV QUALITY
[illegible]

January 5, 1997

Mr. Greg Hallsten
MDEQ
P.O. Box 200901
Helena, MT 59620-0901

As a concerned resident of Montana I am writing to support the GSM Proposed Action in the recently released Draft Environmental Impact Statement.

Golden Sunlight is a major economic contributor of our community, purchasing more than $21 million in goods and services annually. Their annual payroll of $10 million supports 205 families and the businesses that those families patronize. In addition to this economic importance, Golden Sunlight contributes significantly to the area's social well being, through donations and support of community projects.

The mine has continuously demonstrated its commitment to environmental protection with its land purchases to preserve and develop wildlife habitat around the mine site, as well as its pioneering work in steep slope reclamation. Golden Sunlight will reclaim more than 2,000 acres when mining is complete. The mine's water management plan and mixing zone analysis is very detailed and goes above and beyond what is required to protect water
179-1 quality. The partial pit backfill alternative should not be considered since it will do little to improve what is already a through and well thought out reclamation plan.

The mine has made every effort to keep all current information available to anyone interested, they obviously have nothing to hide.

I urge you to expedite preparation of the Final EIS by incorporating the Draft EIS as is, so that the record of decision can be issued as soon as possible and Golden Sunlight can proceed with its expansion.

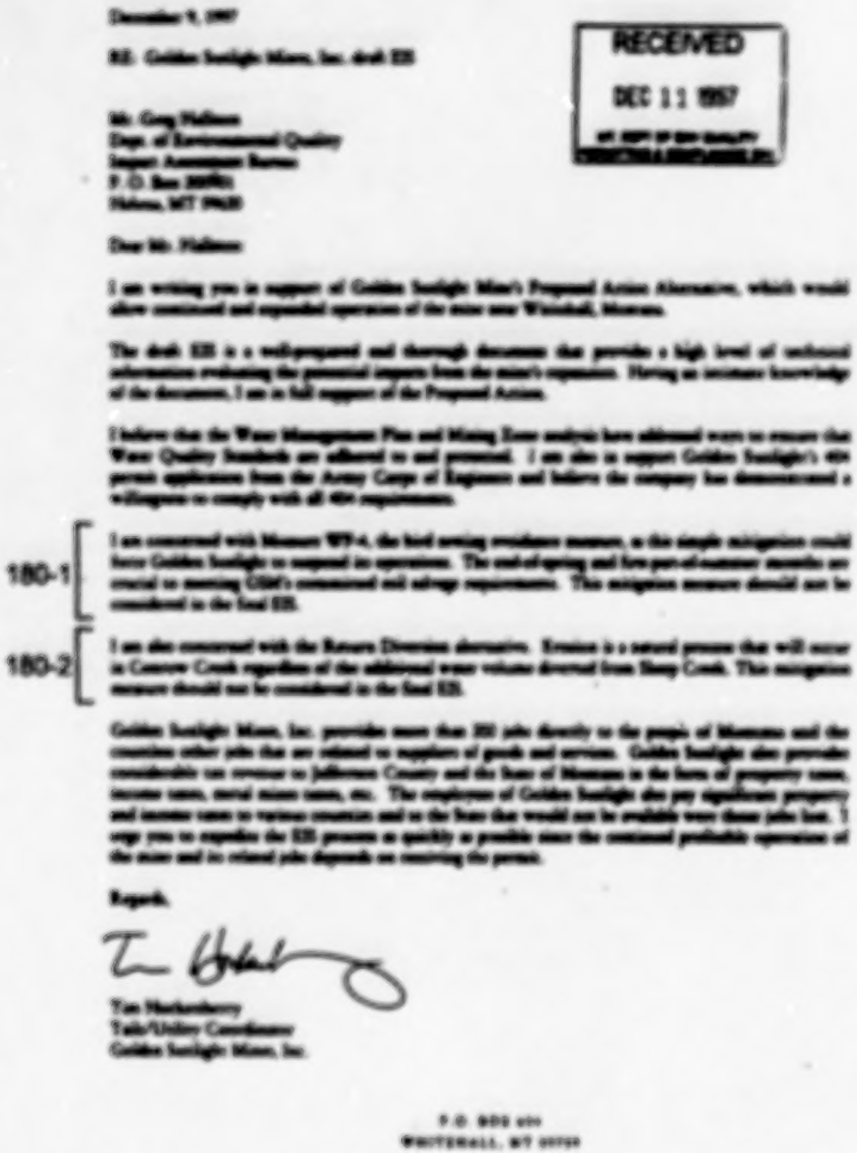
So many families have had to leave Montana to obtain work to support their families, please keep people of Montana in the decision process. We are environmentalists too.

Sincerely,
Jeanne Kluck
[illegible]
Helena MT
59602

Response to Letter 179

179-1 Comment noted. Please see the Response to Comment 23-5.

Letter 180



December 9, 1997

RE: Golden Sunlight Mines, Inc. draft EIS

RECEIVED
DEC 11 1997
MT DEPT OF ENV QUALITY
[illegible]

Mr. Greg Hallsten
Dept. of Environmental Quality
Impact Assessment Bureau
P. O. Box 200901
Helena, MT 59620

Dear Mr. Hallsten:

I am writing you in support of Golden Sunlight Mine's Proposed Action Alternative, which would allow continued and expanded operations of the mine near Whitehall, Montana.

The draft EIS is a well-prepared and thorough document that provides a high level of technical information evaluating the potential impacts from the mine's expansion. Having an intimate knowledge of the document, I am in full support of the Proposed Action.

I believe that the Water Management Plan and Mixing Zone analysis have addressed ways to ensure that Water Quality Standards are adhered to and protected. I am also in support Golden Sunlight's 404 permit application from the Army Corps of Engineers and believe the company has demonstrated a willingness to comply with all 404 requirements.

180-1 I am concerned with Measure WP-4, the bird nesting avoidance measure, as this single mitigation could force Golden Sunlight to suspend its operations. The end of spring and first part of summer months are crucial to meeting GSM's committed soil salvage requirements. This mitigation measure should not be considered in the final EIS.

180-2 I am also concerned with the Return Diversion alternative. Erosion is a natural process that will occur in [illegible] Creek regardless of the additional water volume diverted from Sheep Creek. This mitigation measure should not be considered in the final EIS.

Golden Sunlight Mines, Inc. provides more than 200 jobs directly to the people of Montana and the countless other jobs that are related to suppliers of goods and services. Golden Sunlight also provides considerable tax revenue to Jefferson County and the State of Montana in the form of property taxes, income taxes, metal mines taxes, etc. The employees of Golden Sunlight also pay significant property and income taxes to various counties and to the State that would not be available were these jobs lost. I urge you to expedite the EIS process as quickly as possible since the continued profitable operation of the mine and its related jobs depends on receiving the permit.

Regards,

Tim Hackenberry
Tails/Utility Coordinator
Golden Sunlight Mines, Inc.

P.O. BOX [illegible]
WHITEHALL, MT 59759

Response to Letter 180

180-1 Comment noted. Please see the Response to Comment 23-2.

180-2 Comment noted. Please see the Response to Comment 72-2.

Letter 181

Mr. Greg Hallsten
MDEQ
P.O. Box 200901
Helena, MT 59620-0901

RECEIVED
JAN 12 1998
[illegible]

Dear Mr. Hallsten:

The GSM Draft EIS is an extremely thorough document that provides ample technical information to evaluate all potential impacts from the mine expansion. After reviewing the document, I am in full support of the GSM Proposed Action.

The mine's water management plan and mixing zone analysis is very detailed and provides sufficient contingencies that go above and beyond the extra factor of safety needed to protect water quality.

Appendix H also provides a good analysis that shows how GSM will comply with Section 404 regulations of the U.S. Army Corps of Engineers. GSM's water management, reclamation and habitat preservation work as described in Appendix H will more than compensate for any loss of "Waters of the U.S." from placing waste rock in the dry gulches on site.

181-1 The partial pit backfill alternative should not be considered since it will have little environmental benefit. Water will still have to be handled with or without backfilling, and there would be no improvement to wildlife habitat or air quality. Most importantly pit backfilling will force the mine to close prematurely, which is the same as the No Action Alternative. GSM will reclaim over 2,300 acres when mining is completed. They also have purchased over 4,300 acres of off-site land and lease an additional 1,370 acres of off-site land to preserve open space and wildlife habitat around the mine site. Requiring GSM to backfill their open pit just to cover 233 acres of pit highwall is absurd.

181-2 The use of "avoidance" as a mitigation measure to protect bird nesting habitat (Measure WF-4) is unrealistic and would force GSM to suspend its operations. GSM's off-site preservation of wildlife habitat, and their on-site reclamation, provides sufficient replacement habitat for birds. Avoidance during operations as a mitigation measure should not be considered in the Final EIS.

GSM is an important contributor to Montana's economy. Further delays in GSM's EIS could seriously jeopardize their operation. I urge DEQ and BLM to expedite preparation of the Final EIS by incorporating the Draft EIS as is, so that the ROD can be issued as soon as possible and GSM can proceed with their expansion.

[illegible]

Response to Letter 181

181-1 Comment noted. Please see the Responses to Comments 16-37 and 23-5.

181-2 Comment noted. Please see the Response to Comment 23-2.

Letter 182

Mr. Greg Hallsten
Department of Environmental Quality
Impact Assessment Bureau
P.O. Box 200901
Helena, Montana 59620

RECEIVED
DEC 24 1997
[illegible]

Dear Mr. Hallsten:

I am writing to you in support of Golden Sunlight Mine's proposed action as described in the EIS, which would allow continued and expanded operation of their mine in Whitehall, Montana.

I believe the draft Environmental Impact Statement provides a thorough review of the alternatives and their respective environmental effects. The EIS includes a comprehensive water management plan that provides sufficient contingencies to protect water resources and their downstream beneficial uses.

As one of 208 employees of Golden Sunlight, I can attest to the mine's commitment to reclamation and habitat preservation. The EIS clearly demonstrates that Golden Sunlight will comply with all sections of the 404 requirements.

I urge you to expedite the EIS process and to issue a final EIS as quickly as possible. Golden Sunlight' annual $10 million payroll supports 208 families in my community directly, and generates another $21 million in economic activity through it's purchase of goods and services. Further delays in the issuance of a Record of Decision undermines the operation's viability and the tremendous economic and social benefit the mine provides.

Sincerely,

Jim Loomis
P.O. Box 278
Whitehall, Mt. 59759

Response to Letter 182

Thank you for your letter. No response necessary.

Letter 183

RECEIVED
DEC 23 1997

Mr. Greg Hallsten
MDEQ
P. O. Box 200901

Dear Mr. Hallsten:

The GSM EIS is an extremely through document that provides ample technical information to evaluate all potential impacts from the mine expansion.

183-1 The partial backfill alternative should not be considered since it will have little environmental benefit. Water will still have to be handled with or without backfilling, and there would be no improvement to wildlife habitat or air quality. I have toured the mine and drive by it frequently, the wildlife population is thriving and is an added benefit to us that do not have the opportunity to see deer, antelope and coyote. I consider myself an environmentalist and feel secure that GSM has made protecting and enhancing habitat a priority.

183-2 The use of "avoidance" as a mitigation measure to protect bird-nesting habitat is unrealistic and could force GSM to suspend its operation. Avoidance during operations as a mitigation measure should not be considered in the Final EIS. The efforts that have been made to protect the habitat is beyond what should be required.

GSM is an important contributor to Montana's economy. Further delays in GSM's EIS could seriously jeopardize their operation. Golden Sunlight Mine accounts for a substantial portion of the taxable value of local school districts. It accounts for 32% of Whitehall School District and 63% of the Cardwell School District taxable value.

Montana is consistently losing industry, we need and use products from mining, logging and ranching. Our alternative to using our own products is to buy out of country, the regulations on environmental protection and safety are substantially lower than ours.

I urge DEQ and BLM to incorporate the draft EIS as is, so that the ROD can be issued as soon as possible and GSM can proceed with their expansion.

Sincerely,

Response to Letter 183

183-1 Comment noted. Please see the Response to Comment 23-5.

183-2 Comment noted. Please see the Response to Comment 23-2.

343

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II.C GOLDEN SUNLIGHT MINE INC.'S FORMAL RESPONSE TO LETTER #16

GOLDEN SUNLIGHT MINES, INC.

March 24, 1998

Dave Williams
Bureau of Land Management
106 N. Parkmont, P.O. Box 3388
Butte, MT 59702

Greg Hallsten
Montana DEQ
1520 E. 6th Avenue
Helena, MT 59601

Re: Responses to Plaintiff Group Comments on Draft EIS.

Dear Mr. Williams and Mr. Hallsten:

GSM has reviewed the January 20, 1998 DEIS comment letter to BLM and DEQ prepared by James Kuipers on behalf of the plaintiff group. Our responses to those comments are attached to this letter. We request that these responses be published in the Final EIS as a matter of public record.

The plaintiff's comment letter consisted mostly of selected quotations from the DEIS. Their cover letter stated that the quotations were to provide background for subsequent comments. However, during our review we found that many of the quotations used in the comment letter were not necessarily representative of the actual discussions or conclusions in the DEIS. It would have been more helpful to understand the plaintiff's concerns if the quotations used in the comment letter had reflected the complete DEIS discussion of the particular issues being raised.

We also were surprised by the number of comments that could have been raised beforehand. The plaintiff group had an unprecedented opportunity to be involved in GSM's EIS process by participating in a formal oversight committee. Over the past two years, they were able to review and provide comment on three preliminary Draft EIS documents. The last of which was not significantly different than the published Draft EIS. It would have been more appropriate for the plaintiff group to have voiced their concerns, and work with the committee to resolve any issues, during that time.

Thank you for considering this letter. We appreciate the opportunity to respond to the public comments on our Draft EIS.

Sincerely,

Raymond Lazuk
Director of Environmental Affairs

attachment

453 MT Hwy 2 East • Whitehall, Montana 59759 • 406-287-3257 • Fax 406-287-2035

GSM RESPONSES TO JANUARY 20, 1998 PLAINTIFF GROUP COMMENTS ON DRAFT EIS

1.0 Impacts From Waste Rock Dump Slopes

Response to Quotations from Memorandum and Order:

The quotations from the Memorandum and Order used in the comment letter refer directly to the 1990 EA and do not appear to be related to subsequent comments on the DEIS. However, the quotes are somewhat useful to point out differences between the EA and DEIS. For instance, the concerns on reclamation success raised in 1990 have since been addressed by reclamation studies conducted at GSM over the past seven years and reported in the DEIS. The results of the studies now confirm that all reclamation criteria will be successfully met for 2h:1v slopes.

Response to Quotations from DEIS:

The quotations from the DEIS are very selective and, if not considered together with preceding and subsequent statements, can be misleading. For example, the following excerpt was used in the comment letter "*...although it was found that erosive power is greater on 2:1 as compared to 3:1 slopes...*" By itself, the quote implies that 2:1 slopes may experience greater erosion problems than 3:1 slopes. However, the preceding statement in the DEIS that was not used in the comment letter qualifies the rate of erosion on 2:1 slopes as being acceptable "Under these enhanced climatic conditions, the soil/oxide rock cover system selected for covering the waste rock dump slopes (both 2:1 and 3:1) functioned successfully in terms of limiting infiltration into the waste rock dump. Also, soil erosion under these greater-than-normal precipitation conditions was limited to an acceptable level regardless of slope,".

Other excerpts from the DEIS are used in the comment letter to raise doubts on the suitability of 2:1 slopes for reclamation. In particular, the following quotation used by itself in the comment letter could lead to the erroneous assumption that revegetation success could be limited on 2:1 slopes "*The question of revegetation cover production under below average precipitation conditions remains... Increased runoff will limit to some degree the amount of precipitation that will enter the soil and be available to plants for establishment and growth on 2:1, as compared to 3:1 slope angles.*" The comment letter failed to include the subsequent DEIS text that went on to support the fact that 2:1 slopes will still meet reclamation criteria "It seems reasonable to assume, however, that the differences in runoff between slope angles will not lead to a reclamation failure when considering the overall revegetation success experienced on-site, the vegetation cover capable of being produced on similar adjacent undisturbed slopes through time, and the fact that a drought will affect both 2:1 and 3:1 slopes simultaneously. It therefore seems appropriate to conclude that, while vegetation cover will be somewhat higher on 3:1 slopes due to decreased runoff, 2:1 slopes can be successfully reclaimed, as compared to reference area conditions under limited periods of below average annual precipitation using proven revegetation techniques."

An accurate assessment of 2:1 slope adequacy cannot be made when considering only the selected quotations used in the comment letter. The technical discussion given in the DEIS must be reviewed and considered in its entirety for a balanced evaluation.

Responses to Questions/Comments:

1. The comment made that soil erosion rates were not actually measured at GSM is not true. Soil erosion rates have been physically measured at 2:1 and 3:1 reclamation slope test plots and adjacent natural reference areas at GSM since 1991. The results of these studies show that measured erosion rates on reclaimed slopes (both 2:1 and 3:1) were comparable to or less than erosion rates on adjacent natural reference areas. These data are provided in GSM's 1995 Permit Application, Volume 4, Appendix 5.5.1, Section 4.

2. The comment that vegetation canopy data is biased does not consider the entire discussion presented in the DEIS. The DEIS discussion following the selected quotes used in the comment letter is as follows "Although unsupported by on-site empirical data, the enhanced 1993 and 1994 precipitation rates are assumed to have benefited revegetation efforts on both 2:1 and 3:1 slope angle test plots in terms of the vegetation cover produced, which will not likely be typical under average or below average annual precipitation conditions. It was observed that vegetation cover produced under these amenable conditions was is excess of that produced on the reference areas during the same time period regardless of slope angle (Schafer and Associates 1995a). If the excess in test plot vegetation production over that found on reference areas can be attributed to enhanced rainfall conditions in 1993 and1994, then it seems reasonable to assume that under normal precipitation conditions both 2:1 and 3:1 slopes can be successfully revegetated."

   The DEIS also made the following statement with regard to drought conditions that should also have been quoted in the comment letter "It seems reasonable to assume, however, that the differences in runoff between slope angles will not lead to a reclamation failure when considering the overall revegetation success experienced on-site, the vegetation cover capable of being produced on similar adjacent undisturbed slopes through time, and the fact that a drought will affect both 2:1 and 3:1 slopes simultaneously. It therefore seems appropriate to conclude that, while vegetation cover will be somewhat higher on 3:1 slopes due to decreased runoff, 2:1 slopes can be successfully reclaimed, as compared to reference area conditions under limited periods of below average annual precipitation using proven revegetation techniques."

   In response to the second part of the comment regarding meaningful analysis, it is important to point out that vegetation also was monitored in 1991, 1992 and in 1996, when precipitation was at or below normal. This does provide a range of dry and wet years during the test period to monitor and scientifically evaluate both canopy cover and erosion. The results show that reclamation sites have been equal to or actually outperformed the natural reference areas with regard to vegetation success and erosion control under full range of climatic conditions.

3. GSM's reclamation program is designed to ensure that soil-forming factors exceed soil loss factors. The two tons per acre per year soil loss criteria was selected because it is less than the amount of soil formed per year given the reclamation cover design. This means that canopy cover will be maintained by natural conditions and there would be no net soil loss over the long-term.

4. The first part of the comment incorrectly states that mitigation measures S-4 and S-5 were developed only for 2:1 slopes. It is explicitly stated in the DEIS that these mitigation measures also were developed to address potential failure of a 3:1 slope. The second part of the comment also is untrue. Mitigation measures S-4 and S-5 have been proven to be technically feasible to achieve successful reclamation goals. Page 308 of the DEIS specifically states that mulching in combination with soils containing high rock fragment contents has proven to be successful. Also, mitigation measures S-4 and S-5 state that a combination of alternate erosion control or alternative mulching, cover crop, or seedbed manipulation techniques may be used in lieu of the proven high rock content soils or mulching techniques, if it can be shown that the substituted techniques will provide the same effects with regard to erosion control and increasing revegetation success.

Response to Conclusions:

GSM's reclamation goal is to return the waste rock areas to the previous state of a 2:1 slope configuration to match the slope of the adjacent natural hillsides. Stability is assured by meeting the reclamation criteria of minimizing erosion to less than 2 tons per acre per year, which is less than the soil-forming factor, and by achieving 90 percent of the canopy cover of adjacent reference areas. This will lead to a near steady state condition whereby there is no long-term, net loss of soil from reclaimed areas with a 2:1 slope.

Numerous statements are made throughout Section IV.C.1 of the DEIS that there are no significant differences between 2:1 and 3:1 final slope angles for achieving reclamation success. The Failure Modes and Effects Analysis (FMEA) in DEIS also shows that there are no differences in failure likelihood or consequences between 2:1 and 3:1 slopes. These assessments were made from studies conducted at GSM since 1991 and reported in the 1995 permit amendment application. The conclusion statement in the comment letter that there is significantly increased potential for failure of 2:1 slopes is simply not supported by the results of the studies or by the discussions in the DEIS.

Given the fact that there are no differences between 2:1 and 3:1 slope reclamation success, there is no technical justification to show a preference for 3:1 slopes. The conclusion statement in the comment letter that the only significant advantage is cost savings misses several major points brought out in the DEIS. The advantages of 2:1 slope over 3:1 slope reclamation include less area covered by sulfide waste rock, less borrow soil needed for cover material, less total infiltration, and better visual appearance to blend in with the surrounding area.

The DEIS evaluates the research completed on test plots since 1991. The permit decision made in 1998 will be based in part on the results of this research. This is consistent with the District Court Memorandum and Order that indicated a need to complete all necessary research before making permit decisions. Reclamation test plots at GSM played a key role in designing the reclamation strategy for the proposed action since there is little reclamation data from other hard rock sites that is specifically applicable to GSM. The fundamental question of whether or not a 2:1 slope can successfully be reclaimed is answered clearly by the DEIS based on this research. Page 308 of the DEIS specifically states "In summary, it may be concluded that either 2:1, 3:1, or any combination of these slopes can be successfully reclaimed given the use of an applicable sequence of proven reclamation techniques and attention to detail."

Finally, the last DEIS quote in the conclusions of the comment letter "*revegetation success at the Golden Sunlight Mine site is questionable*" is used out of context. The DEIS quote actually does not refer to 2:1 slopes. The DEIS is explicit in stating that revegetation success can be achieved. Specifically, page 308 of the DEIS states that "Techniques of proven applicability and value, as shown in part by site-specific research, include resoiling with soils containing high (up to 50 percent by volume) rock fragment contents, slope length reduction, surface pitting, rock armoring, seeding with appropriate plant species, and mulching."

In the Proposed Action, GSM would modify these proven reclamation techniques only in two ways: 1) by using seedbed manipulation techniques in place of mulching, and 2) by using soils with a high rock fragment content of 20 percent instead of 50 percent. The seedbed manipulation proposed by GSM consists of using a specialized tractor to actually plant the revegetation seed mix, as opposed to spraying hydromulch combined with seed mix onto the soil. The equipment will disperse the seed mix from a broadcast spreader located at the front of the tractor, which is then covered with soil broken up by a harrow attachment pulled from behind the tractor. This innovative approach to mine site reclamation draws on basic farming principles for planting the revegetation seed mix on a 2:1 slope. GSM has already constructed the tractor and has used it extensively on reclamation areas since 1994. The vegetation growth GSM has experienced from this technique is essentially identical to traditional hydromulching techniques.

The second modification of using 20 percent coarse rock is based on reclamation study results given in the 1995 permit amendment application, Volume 5, Appendix 5.5.2 that show erosion control is successfully achieved with a coarse rock content ranging from 20 percent to 50 percent. Combined with the seed planting technique, the test plot results with 20 percent coarse rock are comparable to the data described in the DEIS for 50 percent coarse rock. GSM's proposed techniques were not evaluated in the DEIS because GSM only began using them in 1994 and there was insufficient time to evaluate the results. However, the DEIS does acknowledge that these techniques "may have value" but that the other techniques (hydromulch and up to 50 percent rock content) have already been proven.

The DEIS is actually referring to GSM's proposed modifications when it states "*revegetation success at the Golden Sunlight Mine site is questionable*", not 2:1 slope reclamation as implied in the conclusions of the comment letter. The conclusions of the comment letter should have included the following statement in the DEIS that address any uncertainties in GSM's proposed reclamation modifications "Mitigation Measures S-4 and S-5, in Section IV.P. Potential Mitigation and Monitoring, have been developed to address this situation."

GSM believes that alternative techniques can be used successfully, but will need to demonstrate the effectiveness and reliability of such techniques before their use is allowed by the regulatory agencies. Under this requirement, it is difficult to conclude that there is any agency bias in the DEIS, as claimed in the comment letter. Instead, there is clear recognition that reclamation techniques should remain flexible and allow for modification based on site-specific, reclamation test plot research.

Ground Movement

Response to Quotations from DEIS:

Like the previous comments on reclamation, the comments on ground movement also are based on selected quotations from the DEIS that, without considering the complete DEIS discussion, incorrectly summarizes what the document actually says. For example, the quote used in the comment letter "*Waste rock dump slopes that are reclaimed at 3:1 would be inherently more stable that the same slopes reclaimed at 2:1, in terms of mass slope stability*" by itself gives the false impression that 2:1 are not stable.

Although not quoted in the comment letter, the actual stability of a 2:1 slope is put into perspective by the subsequent DEIS statement "The earth movement FMEA for the 3:1 Slope Alternative is identical with the analyses done for the Proposed Action, as summarized in Appendix H. Although factors of safety would be higher for 3:1 versus 2:1 slopes, the improved waste rock dump slope stability would not substantially change the failure mode likelihood categories for the West Waste Rock Dump, the Block Buttress, or the expanded East Waste Rock Dump." Although technical in nature, this statement is basically saying that there really are no significant differences in potential failure modes and resultant environmental impacts between 2:1 and 3:1 slopes, and that the stability of 2:1 and 3:1 dump slopes is essentially the same. Additional discussion on page 246 of the DEIS actually points out disadvantages to the 3:1 slopes as follows "Additional acreage would be disturbed by reducing the slope angles. An additional 125 acres would be covered by materials capable of generating ARD in comparison with the Proposed Action Alternative." These points also should have been included in the quotations used in the comment letter. Without a balanced review of the complete DEIS discussion, it is difficult if not impossible to draw accurate technical conclusions.

Responses to Questions/Comments:

1) The statements made in this comment appear to be based on misinterpretations of selected DEIS quotes and are not supported by the analysis in DEIS Appendix H. Appendix H (Table H-12) also shows that the environmental consequences from deformation will be minor, and describes compensating factors to mitigate damage as "Regular inspection and repair of minor surface rupture during mine life and after closure."

   By itself, the selected quote used in the comment letter implies 3:1 slopes are more stable than 2:1 slopes. However, the complete discussion in the DEIS does not support the use of 3:1 slopes. Appendix H specifically states "The earth movement FMEA for the 3:1

Slope Alternative is identical with the analyses done for the Proposed Action, as Summarized in Table H-17", and that 3:1 slopes "would not substantially change the failure mode likelihood categories for the West Dump, the Block Buttress, or the expanded East Dump."

2) The point of this comment is unclear, but appears to erroneously suggest that the level of geotechnical evaluation determines the factor of safety. In application, further evaluation does not change the real factor of safety and therefore the real stability or real risk. However, more evaluation does provide for more confidence in the calculated factor of safety that is used to estimate the real stability and risk. Using worst case assumptions results in a lower calculated factor of safety than using optimistic assumptions. In each case the real stability or risk is the same, but the confidence in the estimated stability and risk will change. Worst case assumptions were used in the DEIS that result in low values for the calculated factor of safeties. More importantly, DEIS Appendix H shows that the environmental risks from the primary failure modes will be the same for the No Action, Proposed Action (combined 2:1 and 3:1 slopes), and 3:1 Slope Alternatives.

3) It is unclear how the comment can state that significant slope failure is inevitable when there are no such statements or conclusions made in the DEIS. The FMEA tables in Appendix H show that the chances of any type of slope failure range from 1 in 10 to 1 in 100 and that the environmental consequences resulting from slope deformation would be minor. The appendix goes on to show that the impacts due to stability are not even significant with the unlikely occurrence of a magnitude 7.5 earthquake.

Response to Conclusions:

The conclusions in the comment letter focus on very select DEIS text and do not consider the complete DEIS geotechnical discussions. There is nothing in the Appendix H FMEA that indicates future ground movement is certain or that significant long-term impacts from the waste dumps, either at a 2:1 or 3:1 slope, would occur due to ground movement. Actual experience at GSM has demonstrated that ground movement can be controlled and mitigated without affecting long-term reclamation success. Compensating factors to mitigate any potential damage from slope deformation have been identified in Appendix H for all of the DEIS alternatives. The data used in the DEIS does not show that a 3:1 slope reduces environmental risk any more than a 2:1 slope, or that a 3:1 slope is necessary as an absolute minimum. DEIS Section IV.C.1.a shows that a 2:1 slope will meet all necessary criteria for reclamation success.

Environmental Consequences

Response to Quotations from DEIS:

The selected DEIS quotations are used to support a general theme in the comment letter that 3:1 slopes are somehow more advantageous than 2:1 slopes. As with previous quotations, the ones used here are generally taken out of context from the DEIS. More importantly, relevant DEIS statements that do not support the contentions made in the comment letter are ignored. For instance, the comment letter quotes page 293 of the DEIS that states the "*seepage rate is not* *significantly affected by slope angle (assuming the proposed reclamation cover design).*" This statement by itself gives the impression that 3:1 slopes do not suffer the disadvantage of allowing greater infiltration to occur into the reclaimed waste rock dump.

While the comment letter points out that the infiltration rate may be similar between 2:1 and 3:1 slopes, it fails to point out that potential ARD impacts to groundwater would not be similar between 2:1 and 3:1 slopes. It is important to complete the rest of the discussion on page 293 that states "**However, the increased surface area (12 percent) associated with flatter slopes would allow additional quantities of water to infiltrate into dumps, resulting in a larger recharge of ARD into the aquifer.**" Without including this key DEIS statement, it apperrs that the comment letter intentionally ignores the fact that potential impacts to the groundwater system would be greater under the 3:1 slope alternative.

Responses to Questions/Comments:

1) The assumption that a 3:1 slope alternative combined with the partial pit backfill alternative produces less disturbance is incorrect. Pit backfilling and 3:1 slope reclamation are two separate issues that do not necessarily justify each other. On the west side of the pit area, the additional land disturbance from a 3:1 slope could be reduced by off-loading waste rock from the top of the west dump for pit backfilling. However, the source area for waste rock needed from the east dump for pit backfilling would not change the outer boundary of a 3:1 slope on the east side.

2) The only practical way that GSM can place waste rock is by dumping at angle of repose. This slope is then regraded for final reclamation. The cost of 3:1 reclamation could not have been reduced by GSM.

Response to Conclusions:

The conclusions in the comment letter ignore the complete technical discussion provided in the DEIS. The DEIS repeatedly states that a 2:1 slope meets all reclamation success criteria. It also is a reasonable expectation that the regulatory agencies representing the public, and third party consultants who prepared the DEIS, performed their obligations in an objective manner.

2.0 Impacts From Acid Mine Drainage

Response to Quotations from Memorandum and Order:

The statements from the Memorandum and Order quoted in the comment letter regarding acid rock drainage (ARD) were with regard to the 1990 EA, not the 1997 DEIS. These earlier statements regarding the 1990 EA have since been addressed by the DEIS. The impacts from ARD are analyzed in DEIS Appendices I and J, and mitigation measures based on reclamation and water management are described in Chapters II and IV, and in DEIS Appendices A and B.

Response to Quotations from DEIS on Potential Impacts:

The information quoted from the DEIS regarding infiltration into the tailing impoundment reclamation caps is taken from several sources. This appears to result in a misunderstanding regarding the reclamation alternatives mentioned in the comment letter.

The No Action alternative includes a clay layer incorporated into the final reclamation cap over the tailing impoundments. The Proposed Action does not include a clay layer in the reclamation caps. Reclamation research by MSU professor Dollhopf concluded that for caps with the clay layer: "Data indicates that during one hydrologic year of natural precipitation, snowfall and snowmelt, water movement from earthen caps into tailing was not measurable." Other research by Schafer and Associates showed that for caps without clay: "Modeling results indicate no infiltration into the tailing facility using a cap consisting of 24 inches of borrow and 24 inches of soil."

With regard to both types of caps, the study by Dollhopf presented in the 1995 GSM permit amendment application (Volume 5, Appendix 5.6-1) indicates there is no significant difference in infiltration between covers with clay and covers without clay. Specifically, the MSU research study states "Since these differences were not significantly different within the framework of a scientific experimental design, there was in fact no differences between covers pertaining to drainage into tailings."

The DEIS evaluates the work of both Dollhopf and Schafer Associates. Although both studies indicate "negligible" infiltration, an average infiltration rate of 0.25 inches per year was used for the DEIS Proposed Action discussion to provide a tangible value of potential long-term seepage with which to develop a long-term water management strategy.

Also, the DEIS quotation used in the comment letter regarding potential liner failure of Impoundment No. 2 does not consider the fact that the liner is underlain by compacted clay-rich material. Page 289 of the DEIS states "the HDPE liner is underlain by compacted clay which should contain most isolated leaks." The comment letter also fails to acknowledge mitigation measure W-8 in DEIS Section IV.P that specifically addresses this issue.

Responses to Questions/Comments

1) It is unclear what information was used as the basis for this comment. There is no evidence of seepage from the waste rock dumps due to infiltration. Therefore, the DEIS statement quoted in the comment letter of "*no impacts to surface water or groundwater quality are anticipated*" is correct.

2) The drain system in Impoundment No. 2 is functioning according to the original design by the engineering firm. However, with or without the drains, any infiltration accumulating in the impoundment area will collect on top of the impermeable liner system and flow into the downgradient reclaim basins through the main embankment.

3) GSM is presently dewatering the open pit by pumping from a small sump located at the very bottom of the pit. GSM also has recently constructed several wells upgradient of the main pit area to intercept regional groundwater before it reaches the sump. The upgradient interception wells reduce the amount of water that enters the main pit area, and therefore could minimize the amount of water that may need long-term treatment. The sump and upgradient wells are standard, proven industry techniques that are effectively controlling groundwater flow in the pit area.

   Based on modeling work and actual pit inflow measurements, the anticipated long-term inflow into the pit will remain relatively small, and will be managed using these existing simple, and time-proven controls. There is no need for the use of extraordinary measures to control groundwater in the pit area.

   GSM's water management plan in DEIS Appendix A uses a combination of contingencies to protect water quality under all potential circumstances. This is an essential requirement of Montana water quality regulations.

Response to Conclusions/Recommendations:

The conclusions/recommendations in the comment letter are based on several incorrect assumptions. The first erroneous assumption is that backfilling would prevent ARD in the pit area. Groundwater inflow into a backfilled pit would still need to be removed and treated because it will come into contact with acid generating materials. GSM also examined the potential to segregate pyrite from mill tailing and concluded that it would be impossible to segregate all pyrite from the mill/tailing stream. The STR separates some, but not all, pyrite within sand size material. Also, the slime portion of the grinding circuit will contain pyrite that passes the STR and goes directly to the tailing impoundment.

It also would be impractical to apply paste technology to GSM's tailing. The addition of cement to tailing was examined as a possible EIS alternative, but was rejected because there was little environmental benefit to be gained. Water treatment is still required at GSM with or without cement paste tailing.

The economic feasibility of backfilling was reviewed by a CPA firm under contract with DEQ. The findings, as described in the Summary to the EIS, indicate that backfilling is not economically feasible. The effect of backfilling on the need to treat water has been evaluated in the EIS. This information shows that the cost of backfilling ($32,500,000 on DEIS page 114) would only result in a small reduction in the amount of ARD that potentially requires treatment at GSM over the long-term (DEIS Appendix A).

ARD Reclamation Criteria

Responses to Questions/Comments:

1) GSM has a geochemical characterization plan in place to identify sulfide and oxide rock mined from the open pit. All rock deposited in waste rock dumps has been characterized as

sulfidic. GSM's reclamation techniques are discussed in DEIS Chapter II, and Appendix A describes the measures GSM will take to prevent impacts to water quality. Also, the question/comment may reflect some confusion with regard to the MMRA language quoted. The MMRA excerpts quoted as basis for the comment refer to open pits not waste rock piles.

2) This comment also misinterprets the MMRA quotations. The language in the MMRA is meant to ensure collection and treatment to a level considered safe to humans and the environment before water is discharged from the pit. Pit water collection and treatment is part of GSM's water management plan in DEIS Appendix A. The comment's interpretation of this language would require GSM to operate its treatment plant within the pit perimeter, which is illogical.

3) A settling or treatment basin cannot be used for the open pit since groundwater will enter the pit from fractures along the pit floor. Under the No Pit Pond Alternative, water would be removed from the underlying rock by pumping, then directed to the treatment plant.

4) GSM will collect and treat objectionable effluent so that it meets all regulatory requirements before discharging the effluent outside of the pit to the adjacent environment. The agency preferred DEIS alternative is to keep the pit dry by pumping. This also allows for evaporation of seepage that appears on the pit walls.

5) This comment also reflects a fundamental misconception of the MMRA and of mining practices in general. The walls of the open pit are not waste rock dumps, and this fact is recognized by the MMRA. Waste rock is mined from the open pit and placed in a separate facility away from the pit area. Both open pit and adjacent waste rock dumps will be reclaimed as per MMRA language.

   Of the four alternatives listed in the MMRA quotation, GSM's plan to prevent runoff of objectionable effluent from the pit is to collect and treat the effluent that may result from contact with the pit walls. Insulation of the pit walls by backfilling does not prevent the formation of objectionable effluent.

Oxidized Rock Cap

Responses to Questions/Comments:

1) GSM will place 24 inches of non ARD-producing soil cover over the oxide subsurface material, and therefore will meet all MMRA criteria for reclamation. GSM also has conducted extensive research to develop its protocols for reclamation design and characterization of the oxide material. All recognized standards were followed.

   The DEIS statement quoted in the comment letter that oxide has "reduced" ARD potential may be misleading. This statement is actually referring to rock that has undergone static, acid/base accounting (ABA) testing. DEIS Appendix I describes the work undertaken by GSM to characterize the true ARD potential of various rock types based on several different types of tests. In addition to static ABA tests, kinetic testing using humidity cell apparatus also was performed on different rock types. Specifically, Appendix I states "Kinetic testing evaluates the rate at which minerock can weather to produce ARD, and in the case of the Golden Sunlight Mine, provides insight into which rock types are best suited for reclamation activities such as capping.....This activity helps to develop a practical tool to segregate mine waste rock types and contribute positively to proper handling of the material to avoid the formation of ARD."

Through use of kinetic testing, it was determined that material with a net acid generating (NAG) test pH result of 4.0 or greater will be non ARD producing and can be used for reclamation capping subsoil without the need for lime amendment. The results of this testing are in GSM's 1995 permit amendment application (Volume 4, Section 6.4). Table I-3 in DEIS Appendix I shows that several of the oxide rock specimens used to characterize ARD potential have "low" to "no risk" of ARD generation.

2) Rock characterization work conducted at GSM shows that waste rock and oxidized rock are homogeneous. Also, the oxide capping material is characterized twice. First, it is sampled and analyzed when it is initially mined, then it is then sampled and analyzed after being placed for reclamation. Based on testing, the material will be used as is or amended with lime, if needed, before being covered by soil material.

3) GSM has been examining the compositional variability of rock types throughout its history of operations. The results of material testing are in GSM's 1995 permit amendment application and are described in DEIS Appendix I. GSM considers all non-oxide waste rock as potentially acid producing, and handles this material according to established reclamation protocols.

Inundation of pyritic material does not eliminate the need for water management at GSM. GSM's reclamation plan already isolates the waste rock to the extent practicable. The conclusion as to the need for long-term water treatment is based on direct field observation, laboratory testing of waste rock, and hydrogeochemical modeling

Water Quality

Responses to Comments/Questions

1) ARD potential has been identified by GSM and all potential ARD impacts have been evaluated in the DEIS. GSM treats all non-oxidized waste rock as potentially being acid-producing. DEIS Appendix A describes water management controls to prevent impacts to downgradient beneficial water uses. The management controls are based on direct field observation, laboratory testing of waste rock, research by GSM consultants, and other hydrogeochemical modeling as described in the EIS. Many of the assumptions used for water management plans in Appendix A also are conservative in that they assume higher than likely flow rates from potential discharge sources. Appendix A then identifies contingency plans which, coupled with the mitigation measures listed in DEIS Section IV.P, provide a tiered approach to ensure that water quality is protected.

2) DEIS Section IV.P lists mitigation measures to address potential problems with seepage from waste rock areas. These mitigation factors inherently consider potential consequences due to local deviations from consistent conditions. Appendix H also describes compensating factors to prevent impacts from slope failure.

3) DEIS Appendix J evaluates potential impacts from ARD with a reasonable level of confidence. Any uncertainties due to the confidence of quantitative data have been acknowledged and are compensated for in the mitigation measures outlined in DEIS Appendix A.

4) The capture rate of groundwater interception wells are based on regional groundwater flow, not infiltration rates into reclaimed dump surfaces. DEIS Appendix L and the groundwater model presented in GSM's 1995 permit amendment application (Volume 3, Appendix 4.7-1) describe regional groundwater flow.

   DEIS Appendix J considers a range of infiltration rates and describes the potential impacts from both higher than expected and lower than expected infiltration. The groundwater controls described in Appendix A to mitigate impacts are based on regional groundwater flow that reflects a natural infiltration recharge rate that is higher than the rate used in Appendix J for reclamation covers. In addition to this conservative approach to groundwater capture, Appendix A provides contingencies for higher than expected inflow from various sources to ensure the required capture efficiency and level of treatment is achieved that protects downgradient water quality. Also, the concentration of potential ARD sources is based on direct measurement of in-situ pore water collected from waste rock test plots during ARD research conducted by GSM consultants. These pore water samples provide for a reliable estimate of future seepage concentrations.

3.0 Impacts Associated with Perpetual Waste Water Treatment

DEIS

Bonding

Response to Recommendations:

The consequences of long-term treatment are reasonably foreseeable and are specifically discussed in DEIS Section IV.B.1.e. The impacts of water treatment also are discussed throughout DEIS Chapter IV for each alternative. It should be noted that every Montana community has some type of waste water treatment system that will operate in perpetuity provided that human residents inhabit the area. The estimated treatment plant capital costs and future funding for plant operation and maintenance will be evaluated and incorporated into GSM's revised reclamation bond.

Sludge

Responses to Questions/Comments:

1) Two sludge samples from pit water treatment testing were analyzed. The pit water tested was of worse quality than the anticipated inflow from sources described in EIS Appendix A. The treatment approach as described in Appendix A is based on industry proven technology.

2) TCLP tests have been performed on treatment plant sludge and the data are presented in EIS Appendix O. Sludge handling technology that is applicable to GSM has been in existence for decades. The minimum 20% moisture content of the sludge is expected to prevent dust formation. However, if dust becomes a problem, a chemical soil-binding agent similar to that presently being used at GSM will periodically be applied to the surface of any areas dry enough to form dust.

   The sludge from GSM's proposed treatment plant will be dewatered before it is placed in the disposal cell. Additional dewatering through evaporation and draining will occur after the material is placed. The disposal cell will be underlain by HDPE to collect any residual seepage from the sludge material for further treatment. The cell will be placed on the surface of decommissioned Impoundment No.2, which also is underlain by HDPE and compacted clay-rich material.

   The life expectancy of HDPE liners will depend on the physical conditions of the site. Tears in an HDPE liner, and subsequent leakage, would only be caused by massive settlement and displacement of the underlying material. The sludge disposal cells themselves will be constructed over portions of the dewatered/consolidated tailing where there is minimal potential for settlement that could cause liner failure. The tailing itself is placed on HDPE over compacted material. The potential for leakage from the tailing HDPE liner has been mitigated by the underlying compacted material which acts as a secondary, low permeability liner. This dual liner system for Impoundment No. 2 greatly reduces any risk of leakage from the tailing area. However, as an additional contingency measure, GSM has constructed groundwater recovery wells downgradient of the area as described in the water management plan in DEIS Appendix A.

3) The issue of tailing consolidation had been considered during preparation of the DEIS. Tailing consolidation/compaction begins as soon as tailing is placed in the impoundment. At closure, final consolidation will occur primarily towards the center of the impoundment. Upon cessation of mining, the outermost perimeter of the impoundment and the area closest to the main embankment will have consolidated such that the first 200 by 200-foot cells can be constructed.

Treatment Process

Response to Comment/Question:

Although similar treatment plants exist, there are no published studies on the reliability of the plants mentioned in the comment letter. However, the issue of treatment plant reliability is addressed in DEIS Appendix K. This analysis evaluates potential failure modes of GSM's proposed treatment plant. Proper design of the treatment plant is critical to ensure compliance with water quality regulations. Appendix A describes GSM's treatment plant design, which will be finalized prior to mine closure to ensure optimum efficacy. The final design also will incorporate knowledge of site specific treatment needs determined from GSM's pilot scale plant.

4.0 Pit Backfilling Feasibility

Response to Quotations from Memorandum and Order:

The selected quotes used in the comment letter from the court determination highlight a previous conflict in language between the MMRA and the Montana Constitution with regard to GSM's 1990 EA. This conflict has since been resolved in GSM's 1995 permit amendment application that provides a pit reclamation plan to fulfill MMRA and Montana Constitutional requirements. The Proposed Action pit reclamation plan requires trees to be planted around the pit perimeter and, where it can be safely performed, any final oxidized benches containing enough fine material to support plant life also will be seeded and planted with trees. In addition, trees will be planted on final benches and talus slopes where safety, stability and material quality allow. This provides for a post-mining beneficial utility to the pit area that will be consistent with the pre-mining condition of the area.

DEIS

Response to Questions/Comments:

Chapter I of the EIS describes how GSM's Proposed Action fulfills the District Court decision and the requirements of MMRA. Further detail on how GSM's Proposed Action pit reclamation plan complies with all Metal Mine Reclamation Act (82-4-336, MCA) requirements is as follows:

82-4-336(1) GSM has committed to completing its pit reclamation activities within the required 2-year period

82-4-336(3) GSM will avoid accumulation of stagnant water in the mined area by continual pumping of water that enters the pit.

82-4-336(5)(a) It is not feasible to insulate all exposed pit faces by covering with fill material to prevent formation of objectionable effluent.

82-4-336(5)(b and c) GSM will contain (drain) objectionable effluent that enters the open pit by pumping it to a treatment facility that will process objectionable effluent to a level considered safe to humans and the surrounding environment before it is discharged away from the pit.

82-4-336(5)(d) The exposure of GSM's post-mine, rock faces to sunlight and air will enhance evaporation of water that can enter the pit (as precipitation and/or groundwater seeps) to form objectionable effluents.

82-4-336(5)(e) The pit perimeter will be bermed and fenced to prevent entrance into the open pit by persons or livestock.

82-4-336(6) GSM's Proposed Action reclamation plan requires trees to be planted around the pit perimeter and, where it can be safely performed, any final oxidized benches containing enough fine material to support plant life also will be seeded and planted with trees. In addition, trees will be planted on final benches and talus slopes where safety, stability and material quality allow. This plan fully meets GSM's reclamation objective of providing wildlife habitat for future beneficial uses of the land.

82-4-336(7)(a) GSM's post-mining open pit will meet the minimal requirements of being structurally competent to withstand geologic and climatic conditions without significant failure that would be a threat to public safety and the environment.

Initially, some rock slides are expected to occur in the post-mine pit, primarily during the early years following closure. However, pit wall stability will increase with time as the least stable portions of the rock face settle into more stable configurations. Eventually, portions of the rock faces in the open pit will resemble the natural cliffs that are evident throughout the area of Bull Mountain.

GSM owns all land within the pit area and uncontrolled public access to the post-mine pit will not be allowed. The safety and security of authorized personnel and equipment required for post-mine maintenance activities will be ensured through measures that include inspection and monitoring of pit walls, as presently being conducted for the current mining operation.

The post-mine open pit also would allow any water that occurs behind the pit walls to freely drain towards the pit bottom, some of which will evaporate.

82-4-336(7)(b) The post-mine utility (functional uses) afforded to humans and the surrounding natural system of an open pit will be similar to the pre-GSM condition. The pre-GSM utility of the open pit area consisted of wildlife habitat and mining. The steep hillside of the area precluded activities such as livestock grazing, agriculture and most types of recreation. There was no known timber harvesting inasmuch as timber is sparse in this area of Bull Mountain.

The only recreation activities that may have occurred in the area prior to GSM's operations were hunting and wildlife viewing. However, these would have been dependent on whether the previous owners of the property allowed access to the area. Uncontrolled public access to the pit area has been prohibited at GSM since operations began, and would continue post-closure due to concerns for the safety and security of maintenance personnel and equipment that would remain in the area.

With a post-mine open pit, wildlife habitat for raptors will be preserved and habitat for bats will be created. A fence will be constructed around the open pit to preclude larger mammals (including humans) from entering the area of exposed rock faces. However, the total acreage of other reclaimed lands at GSM (over 2,500 acres), and the vast areas of land controlled by GSM off-site (over 4,300 acres), provide foraging habitat for larger animals and also would be kept open for public access. This results in a net increase in the acreage available for wildlife habitat and beneficial utility than what previously existed in the area prior to GSM's operations.

A post-mine open pit at GSM also would afford educational utility for students from nearby universities in Butte, Bozeman, Dillon, and Missoula. Portions of exposed pit walls not covered by vegetation or talus material provide an excellent opportunity for students to observe and study the geologic and mining-related aspects of the site.

82-4-336(7)(c) The current reclamation plan will blend the appearance of the open pit with the surrounding area (which includes steep terrain and rock cliffs) to the extent feasible using vegetation as described in 82-4-336(6) above. In time, portions of pit benches also will weather and evolve into rock faces that resemble natural cliffs in the area.

The DEIS describes two key observation points (KOP's) used in a BLM Visual Resource Management (VRM) analysis to characterize the appearance of the site. The first KOP is located at the Whitehall exit of I-90. Since the pit is not visible from this point, it does not affect the VRM class rating. The second KOP is located on Highway 69, approximately one mile north of MT. Highway 2, where the open pit is visible.

Three characteristics help define the VRM rating from the second KOP with respect to the open pit: land and water changes, vegetation changes, and structure changes (e.g. buildings). GSM will pump water from the pit area and therefore water is not an aesthetic concern. The land surface, however, will change from the pre-mining condition. As some portions of the rock faces slide down onto the pit benches, a 1.4:1 slope will eventually form along the highwall. The difference in slope from 1.4:1 (open pit) to 2:1 (backfilled pit) will be difficult to distinguish from the distance at the second KOP. In either open pit or backfilled pit scenarios, a large bowl-shaped landform will exist in the post-mine pit area. The aesthetic differences between these two types of landforms are subjective.

Vegetative cover is the other important characteristic in the VRM rating relevant to the pit area. GSM will revegetate all accessible areas of the pit that will support trees, grasses and shrubs. Over time, the vegetation is expected to spread onto areas that were not vegetated during mine closure.

82-4-336(8) Post-mine public safety will be assured through fences, locked gates, warning signs, and on-site maintenance personnel. As discussed throughout the EIS, there also will be sufficient measures to prevent the pollution of air and water and prevent degradation of adjacent lands from the open pit.

Under any pit reclamation scenario, it will be necessary to pump water from the pit area to prevent migration of objectionable effluent that can form when water (either from precipitation infiltration or groundwater inflow) comes into contact with sulfide-bearing rock.

82-4-336(9) GSM's pit reclamation plan accomplishes the activities specified in 82-4-336, ARM and in the Statement of Intent to 82-4-336, ARM.

82-4-336(10) Precipitation runon into the post-mine pit will be minimized by berms and diversions around the pit perimeter. Pit area groundwater will be controlled by pumping.

STATEMENT OF INTENT

The basic requirements of MMRA reclamation plans are to return the lands to structural stability, and be protective of air and water quality. Further reclamation of open pits and rock faces are to provide functional uses and to blend with surrounding areas to the extent feasible. In determining feasibility of further reclamation, the statement of intent of HB 338 directs DEQ to consider and give effect to each of the following objectives:

(1) encourage mining in Montana,
(2) encourage production of minerals,
(3) encourage reclamation to an aesthetically unobtrusive condition,
(4) encourage reclamation to functional uses including livestock grazing, agriculture, timber, recreation, wildlife habitat, and other industrial uses including mining,
(5) discourage requirements that foreclose future mineral access not developed by current mining, and
(6) discourage requirements that generate undesirable offsite environmental impacts

GSM's pit reclamation plan meets all six requirements in the Statement of Intent, whereas the Partial Pit Backfill Alternative does not meet all six objectives. Requiring partial backfill will force a premature mine closure. This does not encourage mining in Montana. Requiring partial backfill will force GSM to abandon its proposed Stage 5 mine plan. This is a loss of approximately 400,000 ounces of gold in GSM's current ore reserve that would be left in the ground and covered by backfill material. The qualitative and quantitative differences in aesthetics between a partial backfilled pit and an open pit are difficult to measure, and therefore will be subjective. The functional uses of either open pit or partially backfilled pit will be similar to the pre-GSM condition. A partial backfilled pit would foreclose future access to the underlying minerals. At closure, the partial backfill could create offsite impacts due to dust emissions from excavating and placing material, additional consumption and burning of fossil fuel required for loading and hauling backfill, and disturbance to new topsoil borrow areas.

4.0 Other Issues

ARD Water Vapor Rise

Response to Comments

Presently, water vapor venting appears to provide the beneficial use of removing water from the interior of the dump areas. This reduces the amount of water that migrates vertically downward within the dump. There are differences in vegetation types that become established around the area of the vents, but there have been no significant detrimental effects observed over the past seven years of test plot monitoring. The reclaimed dump surfaces will continue to be monitored and, as necessary, DEIS mitigation measure S-1 can be implemented to stabilize the vent area.

Tailings Impoundment Leakage

Responses to Questions/Comments:

1) The potential for leakage through the HDPE liner system at Impoundment No. 2 is of primary concern during liner installation. Therefore, GSM and its liner contractors have developed a rigorous QA/QC program that includes inspection and testing of liner foundation materials and the HDPE liner itself. The portion of the HDPE liner that experienced leakage in the reclaim basin area was accidentally damaged by GSM equipment after the liner was installed. The damage was repaired and steps were taken to prevent such accidents in the future. Contingency measures such as compaction of underlying low permeability material, monitoring, and groundwater interception wells have been developed and implemented (EIS Appendix A) to minimize impacts from HDPE liner leakage.

2) The comment is incorrect in assuming there would be a $145 million dollar cost for lime treatment of tailing water. Based on a conservative rate of precipitation infiltration into the reclaimed tailing cover, less than 10 gpm of tailing would need to be treated over the long-term. The cost mentioned in the comment refers to the alternative of complete tailing neutralization by adding lime to the tailing stream during GSM's operations. This alternative was eliminated from detailed analysis because it was not practical.

3) Paste technology does not eliminate the disadvantages listed in the DEIS for the acid neutralization alternative. It is cost prohibitive and does not prevent the need to manage ARD. It also was eliminated from detailed analysis because the potential long-term discharge from Impoundment No. 2 is less than 10 gpm. This flow can readily be incorporated into the water treatment plant that will be constructed by GSM. Acid neutralization/paste technology as applied to GSM's tailing also is not a proven technology. When all factors are considered, water treatment is the most efficient and proven means to handle ARD. Potential problems with treatment such as scaling have been addressed in the plant design (Appendix A).

4) Frost heaving has not been a problem with the test reclamation covers at GSM since they were constructed in 1991. Also, borrow material would be better suited for capping material than clay since clay is susceptible to both frost heaving and desiccation cracking

5) The liner/tailing drainage system for Impoundment No. 2 is designed so that tailing water flows towards the main embankment underdrains and reclaim basins. The impoundment liner system (HDPE underlain by compacted low permeability material) is intended to prevent leakage. Contingency measures have been developed (Appendix A) to address the unlikely occurrence of leakage as well as higher than anticipated inflow to the water treatment plant.

Response to Conclusions:

Contrary to the statements made in the comment letter conclusions, the DEIS does provide a detailed and subjective overall evaluation of potential leakage from Impoundment No. 2 (see

DEIS Chapter IV.B). Also, GSM has demonstrated the effective use of monitoring wells for pollution prevention and mitigation. The wells were used by GSM to detect low level impacts so that steps could be promptly taken to prevent harm to humans and the environment. GSM also follows performance standards for zero discharge from Impoundment No. 2 by using a HDPE/compacted low permeability material liner system, coupled with frequent liner inspection and groundwater monitoring. This was done to ensure compliance with state and federal water quality laws.

Bonding

Response to Questions/Comments:

All mitigation measures and contingencies have been identified in the DEIS based on analysis of expected and potential environmental impacts. GSM's reclamation bond will be revised to account for the alternative selected in the agencies' permit decision. The bond will consider all necessary long-term impact mitigation and contingency measures. Part of the bond will include funding to establish a permanent trust for continued operation and maintenance for long-term water management. DEIS Appendix A outlines the general costs for the various long-term water management components.

Wildlife

Response to Quotations from DEIS:

The DEIS discussion regarding drain clogging at Impoundment No. 2 (DEIS page 104) quoted in the comment letter is not applicable to the present pond size. Drain efficiency may have been a factor for pond size very early in the operation of the impoundment, but the drain system at Impoundment No. 2 has and continues to function according to the original design by the engineering firm. Pond size is actually controlled by water balance rather than drain efficiency. The primary water balance components include precipitation recharge, evaporative loss, and amount of water reclaimed for ore processing.

Responses to Questions/Comments:

1) GSM has developed a formal policy (attached) that recognizes risk in the tailing area and the need to reduce that risk to the extent feasible using best management practices. Thus far, the risks to wildlife and water quality have been reduced at GSM with the use of hazing and the impoundment liner system. The INCO cyanide destruction process is another step being taken to reduce environmental risk. This illustrates GSM's commitment to use best practices. Paste technology is simply not feasible for GSM's site specific conditions.

2) The reason for constructing the INCO process is to minimize risk in the impoundment area. It is not related to pond size at Impoundment No. 2. Also, water would still continue to drain from the tailing to the reclaim basins over the long-term, either from the underdrains or through the permeable main embankment material.

Purpose and Need

Response to Questions/Comments:

Table 1-2 is intended for the reader to understand all beneficial uses of GSM's products to society. The demand for gold is continually increasing and presently exceeds the amount being produced worldwide.

Economics and Reasonably Foreseeable Future Actions

Response to Questions/Comments:

The DEIS evaluates potential environmental impacts associated with a planned expansion described in GSM's 1995 permit amendment application. Although there is always the possibility of future mining in the area, there are no plans for such activity after the expansion is completed. Changes to GSM's mine plans would be affected by the economics of mineral price, and mining and recovery costs. The purpose and need for the operation would remain the same regardless of changes to mine plans.

Paleontological Resources

Response to Questions/Comments:

There has been no impact to the sites from past mining by GSM. GSM recognizes the value of these historic sites and has sponsored archeological research in the area by MSU.

State Trust Lands

Response to Questions/Comments:

The difference in acreage is due to the difference between surface ownership and subsurface mineral estate. Lease payment records are on file at DNRC for public review. The subsurface lease area that would be affected by GSM's expansion is managed for mineral wealth. GSM holds the mineral leases for this area, and is presently verifying any potential mineral worth. GSM does not intend to disturb state surface land.

Attachment for Response to Comment 1
4.0 Other Issues, Wildlife

GSM Environmental Management Policy

GOLDEN SUNLIGHT MINES, INC.
ENVIRONMENTAL MANAGEMENT POLICY

Mission Statement:

Golden Sunlight Mines, Inc. will conduct its operations in an environmentally conscious manner and in accordance with all state and federal environmental protection laws. We will proactively seek innovative technologies for environmental protection, encourage dialogue with employees and area stakeholders on environmental affairs, and build a positive legacy by creating and preserving natural habitat for the future benefit of all.

The environmental policy of GSM is to maintain compatibility with our neighbors and the surrounding environment through recognition and consideration of all technical, biological, social and ethical factors. This policy is deemed both essential and desirable in light of our proximity to the community of Whitehall and to the natural ecosystems within the Bull Mountains and Jefferson River Valley. The complexities inherent with our location demand that we not only meet, but that we strive to exceed, the basic requirements of governmental regulations and industry performance standards for protecting human health and the environment.

Key Policy Components

Identify and Address Major On-Site Issues

Water Resources: GSM is committed to preventing surface water and groundwater degradation so as to preclude impacts to off-site water users and the Jefferson River hydrologic system. Water resource management at GSM will include the use of control technology in the pit, tailing and waste rock areas coupled with best management practices and site-wide monitoring to ensure compliance with state and federal water quality regulations. Risk reduction in the tailing disposal area will remain a high environmental management priority.

Wildlife: Continuing efforts will be made to protect wildlife species that inhabit or frequent the area. Temporary loss of habitat in waste rock areas will be fully mitigated, and GSM will continue seeking innovative protection measures in the tailing disposal area with the goal of eliminating all hazards to waterfowl.

Air Quality: Air quality will be maintained through dust abatement practices and visual monitoring. The critical areas for dust control will include the crusher facilities, open pit, access and haul roads, and tailing areas.

Reclamation: GSM will reclaim areas of disturbance concurrently with its operations whenever possible. GSM will achieve successful final reclamation of sulfide-bearing materials by using capping designs that minimize erosion and water infiltration. GSM's reclamation efforts will remain focused on the use of steep-slope reclamation techniques to minimize the footprint of waste rock piles, and use of native grasses, shrubs and trees that offer diversity for wildlife forage and cover.

Communication

Environmental awareness and responsibility will be integrated throughout all GSM departments and with contractors by use of project teambuilding and interaction with environmental personnel. Key information will be shared with all GSM stakeholders. Protocols will be maintained to ensure appropriate notification and response to emergency and critical environmental situations.

Self Evaluation and Reporting

GSM will evaluate its environmental performance through self-audits and routine inspections by independent parties. All environmental monitoring information will be reviewed internally to quickly identify and correct potential problems. Environmental information will be provided to regulatory authorities, Placer Dome managers and other key stakeholders on a regular basis.

Community Relations

GSM will use communication and trust as the essential tools to build positive relationships with its neighbors and the general public. The spirit of cooperation and constructive dialogue will be used to promote consensus and resolve environmental concerns. GSM also will seek opportunities to improve the local and regional ecosystems beyond the boundaries of its operations. GSM will work individually and cooperatively with regulatory agencies and conservation groups to enhance off-site wildlife habitat and preserve open space.

Research

GSM has and will continue to conduct research in consort with the Placer Dome Group, universities, private industry, and government agencies to develop advanced technology in the areas of mine-waste management, reclamation, and water resources control and protection. GSM will put its research to practical use on-site, and will openly share the results with other industry members and the general public.

Environmental Goal

GSM believes that the future of our industry lies in the hands of its public stakeholders, and will be determined by both the perceptions and the realities of how we care for the land during and following our operations. Our goal therefore must be to demonstrate that both mining and environmental protection are not mutually exclusive but can be managed to the benefit of all. To achieve this goal, our environmental policy will be driven by a guiding philosophy comprised of the following principles:

- be action-oriented
- seek tangible results
- listen to public concerns
- promote employee awareness and participation
- communicate with all stakeholders
- offer educational opportunities
- be proactive
- lead by example.

These principles will enable GSM to reach a high level of performance for successful control and mitigation of all potential impacts associated with our operations. Our policy and practice assures GSM's acceptance by the local and regional community as an industry leader through mine life and beyond closure.

Jerry Harrington, Mine Manager

Raymond Lazuk, Environmental Director

November 1997

III MODIFICATIONS AND CORRECTIONS

the buttress, continued waste rock deposition required modification of GSM's waste rock dumping operations. Waste rock was no longer placed at the head of the slide block, and waste rock dumps were redesigned to improve stability. Open pit and waste rock dump design revisions are described in detail in Section II.B.1.a, Current Mining Operations. Stability monitoring and contingency plans also are described in Section II.B.1.a, Current Mining Operations.

I.A.4 January 1995 to 1997 (Interim Dump Plan)

Mining, ore processing, and tailings disposal continue at the mine site under the *Interim Dump Plan*, which was approved by the newly formed MDEQ as two minor permit revisions in 1995 and 1997. The *Interim Dump Plan* allows GSM to continue mining through the EIS preparation period in accordance with the Settlement Agreement by providing alternative waste rock dump space within the existing permit boundary. Alternative waste rock dump space was needed because stability concerns prohibited GSM from depositing waste rock in areas originally designed as waste rock dumps under Amendment 008. Waste dump designs were revised in the *Interim Dump Plan* so that ground movement would not be reactivated. The *Interim Dump Plan* provides for 136 acres of alternate waste rock dump space in the buttress area. Under current production rates, the permitted waste rock disposal capacity will be filled in late 1997 or 1998.

Waste dumps and other facilities authorized by Amendment 008 and the *Interim Dump Plan* are shown as existing mine facilities in Map I-2 and described in detail in the Operating Permit (GSM 1995a). Other minor permit revisions during 1995 described in the Operating Permit include construction of a drill core storage building and replacement of underground fuel tanks with above-ground fuel tanks (GSM 1995a). Minor revisions in 1996 include: new monitoring well and geotechnical hole locations; waste rock dump expansion; approval to use borrow material for capping the off-loaded East Waste Rock Dump; and, approval to use a snow cat to seed and fertilize reclamation slopes rather than hydromulching.

I.A.5 Operations Under Existing Mine Permits

The Operating Permit summarizes operations under the existing mine permit (Operating Permit 00065) and its amendments (GSM 1995a). The Operating Permit provides maps of existing operational areas and facilities, and the text describes the operation, monitoring, mitigation, reclamation, and closure plans. Permit amendments and revisions, including the 31 stipulations of Amendment 008, also are described in the Operating Permit. Measures that have been implemented to meet requirements of the stipulations are discussed later in this chapter, and in GSM's Annual Reports.

The existing environmental conditions at the mine site are dominated by mine-related activities, including open-pit mining, waste rock disposal, ore processing, and tailings disposal. The pit lies just east of the topographic divide of Bull Mountain and encompasses an area of approximately 312 acres. ~~Currently, the pit bottom is at an elevation of 5,226 feet.~~ ***The elevation of the pit bottom at the end of the Interim Dump Plan will be approximately 5,075 feet.*** Approximately 29.0 million tons of ore were processed through the end of 1995. The *Interim Dump Plan* allows for processing an additional 5.1 million tons of ore while limiting disturbance to existing permit boundaries. Total surface disturbance at the end of the *Interim Dump Plan* (circa late 1997) within the existing approved permit boundary is estimated to be approximately 2,336 acres.

Exploration, geotechnical, and groundwater monitoring investigations at the mine site continue in accordance with Exploration License 000297. Approved activities under the exploration license plan for the next 4 years (until 2000) include:

- Geological mapping;
- Geologic, geophysical, and geochemical testing;

Disturbed areas related to the permanent water treatment facility are shown on Map I-2. The access road for the facility will extend along the corridor shown on Map I-2. Utility lines will follow the access road. GSM will monitor the quantity and quality of sludge produced at the permanent water treatment plant on a quarterly basis and provide this information to MDEQ and BLM on an annual basis. Based on initial results from samples collected at GSM's existing operational water treatment plant, the sludge produced from the permanent water treatment plant is not likely to be hazardous waste under the RCRA (GSM 1995b). Appendix C outlines the revised sludge disposal plan for the permanent water treatment plant.

It is estimated that sludge production at the permanent water treatment plant will be ~~17~~ *66* cubic yards per day. ~~from plant start-up through year 10, and 21 cubic yards per day beyond year 10.~~ The dewatered sludge will have a minimum solids content of 50 percent by weight. The sludge will be pumped to a sludge disposal landfill located on the surface of Tailings Impoundment No. 2. At the landfill, sludge will be disked, dried, and compacted, reducing the final volume. Landfill cells will be constructed with geomembrane liners. The tailings impoundment liner will provide a secondary leakage containment system. ~~From plant start-up through year 10, two 184-foot square cells will be required. Beyond year 10,~~ *Sludge disposal* cells will be 200 square feet. Cells will be filled to a 20-foot depth. This corresponds to a storage capacity of ~~5 years~~ *588 days* worth of sludge production per cell. The final surface area of Tailings Impoundment No. 2 will be 185.5 acres, providing adequate storage area for over ~~1,000~~ *250* years worth of sludge production. ~~At cell closure, a geomembrane liner will be placed over the surface of the compacted sludge; stockpiled capping materials will then be placed over the geomembrane and revegetated (Appendix C).~~ *When the entire surface has been covered with sludge disposal cells, a new layer of cells can be constructed on top of the original layer (Appendix C).*

Reclamation of the permanent water treatment plant and associated utility corridors and power lines will take place when treatment is no longer necessary. However, no site specific reclamation plan exists in GSM's current Operating Permit for the water treatment plant.

Soil Management

Topsoil and subsoil suitable for plant growth is removed and salvaged from slopes that allow safe operating practices. Soil salvage techniques, stockpile seed mixes, and suitability criteria are described in GSM's existing Operating Permit (Section E, Reclamation Plan, in GSM 1995a). In areas with limited soil availability, additional soil will be salvaged on steep slopes with modified equipment, or soils will be salvaged with a coarse fragment content that exceeds 50 percent by volume as previously approved by MDEQ and BLM. Salvage depths for topsoil and subsoil are staked according to soil surveys, and frequent quality checks are made during soil removal. Depth specifications for soil cover material, by mine facility area, are presented in Table II-7. Estimated soil requirements by mine facility area, for reclamation under the No Action Alternative are presented in Table II-8. The total estimated soil volume required for reclamation under the No Action Alternative is 4,154,700 cubic yards. The total estimated soil volume available is 3,831,800 cubic yards. Soil volumes and soil salvage plans are reported to MDEQ and BLM on an annual basis to ensure that soil volumes in stockpiles are sufficient to meet reclamation needs. Shortfalls in soil volume available will be compensated by soil from borrow areas in the tailings dam miscellaneous area, the buttress miscellaneous area, or the plantsite miscellaneous area.

Oxidized Rock Salvage

Oxidized waste rock has a reduced potential to generate ARD. Oxidized waste rock is salvaged from the pit to provide nearly neutral material for reclamation capping. Stockpiled oxidized waste rock includes some materials from oxidized mass-wasting deposits east of the pit. Depth specifications for neutral capping material, by mine facility area, are presented in Table II-7. Estimated oxidized rock requirements for reclamation under the No are described in detail in Section III.B.2.d, Springs and Seeps.

The main branch of Conrow Creek drains an area of approximately 5.8 square miles. Discharge for the runoff from the 100-year, 1-hour precipitation event has been estimated at 50 cfs (GSM 1996d). The one-half PMF for Conrow Creek has been estimated at 2,756 cfs (GSM 1997).

Upper Sheep Rock Creek has a drainage area of approximately 1.2 square miles. Discharge from the 100-year, 1-hour precipitation event has been estimated at 15 cfs (GSM 1996d). The one-half PMF for Upper Sheep Rock Creek has been estimated at 976 cfs (GSM 1997).

Flow measurements have been recorded at U.S. Geological Survey (USGS) stream gaging stations on the Boulder and Jefferson Rivers since 1924 and 1978, respectively. The Boulder River has maximum, minimum, and mean discharges of 7,000 cfs, 0 cfs, and 120 cfs, respectively. A USGS stream gaging station located approximately 30 miles east of the mine area indicates that the maximum, minimum, and mean discharge at this station are 15,900 cfs, 250 cfs, and 2,421 cfs, respectively. A USGS stream gaging station, located on the Boulder River approximately 20 miles north of the site, indicates the maximum, minimum, and mean discharges are 7,000 cfs, 0 cfs, and 120 cfs, respectively.

The Jefferson River has maximum, minimum and mean discharges of 15,900 cfs, 250 cfs, and 2,421 cfs, respectively. It should be noted, however, that flow measurements at these gaging stations are not representative of flow conditions in the river near the Golden Sunlight Mine, because there are numerous inputs and outputs to and from the river between the Golden Sunlight Mine project boundary and the USGS gaging station.

III.B.1.c Surface Water Quality

Surface water quality data collected at sampling sites on Jefferson Slough downgradient from the GSM project area, and from storm water runoff at ephemeral drainage locations in the vicinity of the project area, are presented in GSM 1995b, 1995c, 1996a and are summarized below.

Surface water samples are routinely collected by GSM at three locations on the Jefferson Slough. Sampling sites in the Jefferson Slough include one site above the Golden Sunlight Mine pumphouse (SW-3), and two sites below the pumphouse (SW-6 and SW-8). In general, all surface water sampling sites in the Jefferson Slough have historically shown low concentrations of TDS and near neutral pH. Cyanide is included in the analytical schedule for these sites, because the slough is located downgradient (south) of the tailings impoundments. Recent analyses for total cyanide have shown this parameter to be at concentrations below the analytical detection limit (<0.005 milligrams per liter [mg/L]). Sporadic detections of cyanide at these sites in the past are considered anomalous and are likely attributable to field or laboratory error, since duplicate or subsequent samples were below detection.

Several samples of storm water runoff also were collected from all three tributaries of Conrow Creek. The water quality in this area of the project is alkaline with very low concentrations of trace metals, except for aluminum and iron, which are naturally elevated. There are no recorded springs or seeps east of Sheep Rock Creek, and the only surface water that could potentially be sampled would be storm runoff from ephemeral stream drainages. Water quality data for the springs and seeps are presented in Section III.B.2.d. Water quality data for the open pit pond is described in Section III.B.2.e.

No ARD is currently discharging from the waste rock dumps. However, monitoring of conditions in reclaimed dumps shows that the waste rock has the geochemical potential to generate ARD, and that oxidation of sulfide minerals is presently occuring due to infiltration of moisture. Monitoring data suggest that a wetting front is migrating very slowly through the dumps. The slow rate of this migration is attributed in part to efforts to limit meteoric water run-on by upslope catchments and partly to geochemical reactions, which consume or dissipate water. At present, these processes appear to be effectively limiting the production of ARD at dump toes and, thereby, its potential migration and impact on the local environment.

ARD is being produced by the ore stockpile near the mill. ARD-impacted stormwater runoff from the stockpile is captured in a lined pond and routed into the water treatment plant. Effluent from the plant is used in the milling process.

III.B.2 Groundwater Resources

Groundwater occurs at the Golden Sunlight Mine area in regional and local aquifer systems comprising several hydrogeologic units. A hydrogeologic unit can be comprised of several geologic materials that have similar hydrologic properties. The units are generally connected, and groundwater movement is dominantly controlled by regional topography. The hydrogeology of the area has been characterized by evaluating data compiled from drilling investigations; well logs; water level records; aquifer test results; water quality analyses; and geologic, topographic, and potentiometric surface maps.

III.B.2.a Regional Groundwater System

The regional groundwater system at the Golden Sunlight Mine occurs in five principal hydrogeologic units. The two most important hydrogeologic units in terms of areal extent and saturated thickness are fractured bedrock consisting of the Precambrian and the Bozeman Group sediments (Map III-1, Figure III-1, and Figure III-2).

The Precambrian fractured bedrock is the primary hydrogeologic unit that occurs within and west of the Bull Mountain area. The bedrock consists of several different lithologies (rock types), which include siltstone, mudstone, sandstone, and shale containing sulfide mineralization. These sulfides are widely distributed and are easily oxidized.

Bull Mountain groundwater flow in the fractured bedrock is controlled by secondary openings such as joints, fractures, and other geologic structures, such as fault zones. The permeability of this unit is a function of the heterogenous fracture geometry (secondary porosity), rather than granular (primary) porosity. Depending on the fracture width, spacing, and orientation, some fracture systems will transmit more water than others. Bedrock permeability varies significantly on a local scale, but when examined on a more regional scale, bedrock permeability can be characterized by an average or bulk permeability. Regional ~~analyses yield bulk bedrock permeabilities with values on the order of 10^{-4} cm/sec to 10^{-7} cm/sec, with generally lower values in deeper zones.~~ *Aquifer tests and core hole packer tests have been performed to evaluate the bedrock permeability in the mine area. The results of these tests are summarized in Hydrometrics (1996). Hydrometrics indicated bulk hydraulic conductivities ranging from 10^{-6} cm/sec to 10^{-2} cm/sec, averaging 10^{-5} cm/sec in their calibrated model. Testing of fracture zones indicates hydraulic conductivities as high as 10^{-3} cm/sec along fractures. In addition, testing of a deeper well aquifer suggests that within the pit area, hydraulic conductivities decrease with depth. Overall, the current data and model calibration suggest that the average bulk hydraulic conductivities of the bedrock are is on the order of 10^{-5} cm/sec.*

The Tertiary Bozeman Group is a hydrogeologic unit that occurs over the entire Golden Sunlight Mine area east and south of Bull Mountain where it overlies the bedrock unit. It is comprised of alternating layers and lenses of sand, silt, and clay deposited in a fluvial (river or stream) environment. Inspection of drill cuttings has shown fine to coarse-grained sand intermixed within clay and thin sand and gravel lenses. The discrete layers of clay, silt, sand, and fine gravel within the Bozeman unit are discontinuous due to the fluvial (river or stream) depositional environment. However, the frequency of occurrence of sand and gravel lenses suggests that these lenses are interconnected to some degree, controlling the primary permeability of the unit. The Bozeman unit typically has a low bulk permeability (2.5 x 10^{-4} to 7 x 10^{-4} cm/sec) due to the abundance of silt and clay, but it can locally exhibit top of the geomembrane liner, and is conveyed into the reclaim ponds below the impoundment. Reclaim water is then recycled back to the mill complex ore processing circuit.

A double-liner system comprising two, 60 mil HDPE geomembranes was originally built under the reclaim basins. This system was connected to the single liner underlying the tailings impoundment to form a continuous liner. The primary and secondary liners under the reclaim ponds are separated by an HDPE drainage net. The intent of this design is to allow detection of any leakage from the primary liner, and to convey the leaking fluids to leak detection sumps which are monitored.

Since 1995, cyanide has been detected intermittently in groundwater in several T2PB monitoring wells downgradient of the Tailings Impoundment No. 2 reclaim ponds. Intermittent detections were typically just above the laboratory detection limit of 0.005 ppm. The area around the reclaim basins was investigated in 1995 and 1996 to identify potential sources of cyanide. Temporary monitoring wells were installed in 1996 between the main embankment of the impoundment and the reclaim basins. Cyanide was not detected in groundwater from the temporary wells, indicating that the impoundment was not the source. Inspection of the east basin liner indicated that the source of leakage was likely the east reclaim pond.

The portion of the east reclaim basin where the tailings impoundment underdrains enter the basin was dewatered and inspected in 1995. Defects in the liner were detected and initial repairs were made at that time. The repair work continued in 1996 by reconstructing the double-liner system of the east basin to minimize the potential for leakage. A third liner was added to the sump area of the east basin. Groundwater wells around the basin area are monitored monthly by GSM (GSM 1996a). An insufficient time has elapsed since the repairs were made to detect (based on monitoring well data) whether or not the repairs to the east reclaim pond liner have been effective in eliminating leakage.

Historic Groundwater Quality

Ambient groundwater quality in the vicinity of the tailings impoundments is provided in the database at GSM and in the records provided to the Montana DEQ (GSM 1995a, 1995c, 1996a). Appendix B contains summary tables of the water quality data, and statistical relationships for various groundwater regions that have been delineated for the site for purposes of impact analyses. In general, ambient water quality is good in the areas east and south of Tailings Impoundment No. 2, with statistical mean TDS values of about 400 to 600 mg/L and sulfate levels less than 100 to 300 mg/L. Downgradient of Tailings Impoundment No. 1 in the areas of the south pumpback wells and west of the impoundment, water quality is poorer with TDS mean values on the order of 1,000 to 1,200 mg/L, and sulfate concentration means of about 350 to 400 mg/L. In general, pH is near neutral, and metals concentrations are below Montana Numeric Water Quality Standards in the groundwater around the tailings impoundments.

Evaluation of Historic Seepage Impacts to Current Groundwater Quality

The seepage that migrated past the slurry wall below Tailings Impoundment No. 1 prior to 1990 traveled preferentially to the south within the shallow alluvium and then through gravels associated with the Jefferson River hydrologic system. Cyanide was detected at very low concentrations in groundwater off-site of the Golden Sunlight Mine property in May 1985 from a private well located approximately 1.3 miles southeast of the slurry wall *(GSM 1995c)*.

In response to detection of contaminants, GSM monitored over 20 private wells in the vicinity of the mine site. Seven of the wells showed the presence of cyanide at least once during the monitoring period *(Appendix B, Section H, Groundwater Wells Southeast of Project Site)*. GSM subsequently installed water treatment systems for potentially affected well owners and has monitored 13 residential wells on a regular basis for the past 10 years. Data collected from private wells since the mid-1980s show that concentrations of cyanide have been steadily diminishing with time. As of mid-1994, concentrations of total cyanide were only sporadically detected in any of the private wells off-site *(Appendix B, Section H, Groundwater Wells Southeast of Project Site)*.

Several private wells downgradient of the tailings impoundments were found to contain elevated levels of nitrate. In 1987, an investigation by the Montana Department of State Lands (DSL 1987) concluded that the elevated nitrate levels in the wells were not related to mining activities. Subsequent to the 1987 MDSL report, an additional investigation (DSL 1988) was conducted to identify the nitrate source. The report (DSL 1988) concluded that the elevated nitrate levels were the result of natural nitrification of both existing soil organic matter and pre-existing nitrogen coupled with fallow farming and irrigation practices.

The existing impacts to groundwater as the result of historic seepage from Tailings Impoundment No. 1 were evaluated based on previous reports and available data. The groundwater impacts of concern are associated with increased concentrations of constituents common to the tailings water that seeps from the impoundment, specifically cyanide and nitrate. Maximum concentrations of cyanide and nitrate (as N) in the third row of SPB wells were reported in 1996 as being 30 mg/L and 10 mg/L, respectively (Hydrometrics 1997).

Impacts to groundwater that are associated with historic tailings impoundment seepage that was not captured by the pumpback system were evaluated by three approaches:

- constituent correlations
- isotopic data, and
- mass balance calculations

Increased concentrations of cyanide and nitrate in groundwater apparently occurred in the monitoring area during discrete periods as a result of seepage from the tailings impoundment. However, impacts to groundwater downgradient of the pumpback wells after 1990 have been greatly reduced or eliminated. Although nitrate concentrations have been mostly variable during the monitoring period, cyanide concentrations after 1990 were very low or below detection (less than 0.005 mg/L) in most monitoring wells. Figure III-13 shows the cyanide and nitrate concentrations in monitoring well OW-4. This plot is representative of the concentration trends in downgradient monitoring wells.

The current extent of tailings impoundment seepage still shows variable cyanide concentrations in the tailings impoundment pumpback wells. Some wells have remained relatively unchanged since monitoring began over 10 years ago, and others show either increasing or decreasing concentration trends. Concentrations of seepage in groundwater have been decreasing with time in the first row of SPB wells located upgradient of the slurry cutoff wall. This trend is consistent with the gradual decrease in cyanide concentrations from the impoundment. However, cyanide concentrations in groundwater from several wells along the second and third rows of SPB wells have been gradually increasing with time. The increase is assumed to reflect gradual movement of cyanide away from the slurry wall, as induced by continued pumping from second and third row SPB wells.

Since nitrate concentrations in groundwater could be influenced by other sources (i.e., farming and irrigation practices), cyanide is a more reliable indicator of impacts from Tailings Impoundment No. 1. Although cyanide can be broken down into other constituents through a series of oxidation reactions, the reactions are generally facilitated in natural systems by high dissolved oxygen concentrations, microbial growth, or sunlight. These influences are typically not found, or are greatly reduced, in most saturated aquifer systems. Therefore, fluctuations in nitrate concentrations resulting from tailings impoundment seepage should display a correlation to relative fluctuations in cyanide concentrations, even in off-site monitoring wells. These correlations with the fluctuating nitrate concentrations have generally not been observed.

In addition, a few nitrogen isotope analyses were performed and reported by MDSL (1988).

quality within its proposed boundaries. The mixing zone proposed by GSM would extend to GSM's existing permit boundary to the north, east, and southeast of the mine; and approximately 0.5 mile beyond GSM's existing permit boundary to the west and southwest of the mine (see Figure 5-1 in Appendix B).

ARD fate and transport analyses (see Appendix J) indicate that full chemical neutralization of ARD from the East Waste Rock Dump will likely occur within 2,200 to 4,400 feet downgradient from the toe of the dump because of the neutralizing characteristics of the aquifer materials and dilution. Thus, natural neutralization of East Waste Rock Dump ARD is expected to occur within GSM's proposed mixing zone limits (see Figure 5-1 in Appendix B).

Because of the different hydrogeologic conditions on the west side of the mine, natural neutralization of ARD from the West Waste Rock Dump is anticipated to be minimal (attributed to dilution only). Long-term monitoring and implementation of groundwater protection measures for ARD seepage from the West Waste Rock Dump are described in GSM's Long-Term Water Management Plan (see Appendix A). The analyses provided in Appendix B indicate that with an efficient West Waste Rock Dump groundwater capture system, which is part of GSM's Water Management Plan, ARD impacts can be contained within the mixing zone limits that have been proposed by GSM (see Figure 5-1 in Appendix B). The evaluation presented in Appendix L indicates it is technically feasible to install an efficient groundwater capture system for the West Waste Rock Dump, provided adequate site characterization is done to identify preferential flow paths in bedrock fracture zones, and/or conservative capture well spacings are used to ensure that all major fracture zones are intersected by at least one well.

Estimation of Long-Term ARD Production by Waste Rock Dumps. The long-term quality of discharge from the toe or base of a waste rock dump is controlled by the flow of water through the dump materials, the availability of oxygen, and the abundance of sulfide minerals in the waste rock (see Appendix I). The existing reclamation plan provides for capping of all waste rock dump surfaces with 24 inches of oxide or neutral rock having a NAG pH greater than 4, plus a cover-soil that will be revegetated. The cover-soil will be 19 inches on the West Waste Rock Dump, and 24 inches on the East Waste Rock Dump. The grain size of the soil is anticipated to have a higher water retention capacity than the oxide waste rock and is expected to minimize infiltration which falls on the dump in the form of direct precipitation (either rain or snow). Revegetation of the surface will provide additional water consumption. The reclamation cover is designed to limit water infiltration, thus minimizing the migration of ARD through the interior of the waste rock dumps.

Research at other sites indicates waste rock dump capping greatly reduces infiltration and reduces the potential for experiencing an initial, very concentrated spike or peak of ARD discharge that is substantially more concentrated than the long-term average. The reduction or elimination of the initial spike effect from waste rock dumps minimizes impacts by avoiding extreme short-term ARD loading (the amount of ARD released per unit time) to the local groundwater and surface water environment. Thus, capping measures aimed at reducing water infiltration rates will reduce pollutant load in the short-term. However, based on the results from long-term ARD studies conducted at other sites, ARD load could return to a value dictated by the overall oxidation rate in the long-term (Harries and Ritchie 1987; Harries and Ritchie 1985; Bell et al. 1994; Trembley 1994). These studies indicate that the long-term load exiting the base of the waste rock dumps may be independent of the rate at which water infiltrates the dump, and that for a range of potential infiltration rates the long-term ARD load would be expected to be similar.

At Golden Sunlight Mine, three modeling approaches were used to provide an assessment of the water balance within reclaimed dumps:

materials, thereby enhancing overall plant growth potentials (MDSL and BLM 1980). This excess also could potentially reduce soil fertility slightly and cause surficial crusting in extreme cases. The degree to which this will occur, however, cannot be estimated. Soil chemistry also will be modified through soil stockpiling as anaerobic conditions within the stockpiles develop. Soil chemical changes due to stockpiling are considered to be short-term and redeemable to a level commensurate with vegetation establishment following resoiling. The proposed soil sampling and fertilization program should adequately address soil chemistry concerns and limit this impact to the short-term. Isolated spill accidents, should they occur, could result in minor soil contamination from oils, solvents, etc. Such spills will normally result in soils deemed unsuitable for reclamation. Soils so affected could be buried to effectively reduce the effects of this impact or otherwise be disposed of in accordance with state and federal waste regulations. The volume of soil subject to spills would be limited, however, given the plan to salvage suitable soils prior to operational disturbances and the proposed implementation of a Spill Prevention Plan. Therefore, no impact to revegetation potential is anticipated.

Subsurface materials upon which salvaged soils will potentially be replaced consist of endemic subsoils, two general types of waste rock, and tailings. Baseline data indicate that endemic subsoils contain no chemical constituents that would degrade soils applied for revegetation purposes, given that these subsoils naturally underlie the project area (Houlton and Noel 1995, Revised). Unoxidized (or "dump") waste rock is typically acidic with mean paste and NAG pH values of 5.5 and 3.3, respectively. The ABA of this material, computed by subtracting the acid potential from the neutralizing potential, averages approximately -48 tons of $CaCO_3$ per 1,000 tons of material, indicating a waste rock with a high potential to generate acid through time. Oxide (or "oxidized") waste rock, which will be used to "cap" unoxidized waste rock during reclamation activities, exhibits a higher average paste pH value of 5.8 and higher NAG pH values ranging, on average, from 5.0 to 5.7. The ABA of these materials exhibit average ranges from -2.7 to -9.5 tons of $CaCO_3$ per 1,000 tons of material, indicating a waste rock type which will be notably less acid-producing and more amenable to vegetation establishment than unoxidized waste rock. Tailings, which have an initial high pH averaging 8.4 due to ore processing activities, are an acid-producing material on the order of unoxidized waste rock, with a NAG pH of 2.4. The average ABA of tailings is -77 tons of $CaCO_3$ per 1,000 tons of material (Schafer and Associates 1995a). Soils placed over the acid-producing unoxidized waste rock and tailings materials could be subject to some level of degradation at the soil/waste material interface and to some depth above this zone due to capillary rise (MDSL and BLM 1980). The extent to which this will occur is likely to be limited, given the revegetation techniques proposed by GSM, as discussed below.

Isolated steam venting from settling cracks in waste rock dump test plots is occurring at a number of locations. Venting could cause a modification of soil ***chemical chemistry and soil moisture*** conditions leading to a change in the vegetation communities over time. ***Changes in plant community dominance, including an increase in moss and Canada bluegrass, were documented by agency reclamation personnel during site inspections at the mine in 1995. The vents also could have the desirable effect of helping to remove moisture that has penetrated the reclamation caps into the soil supporting the developing reclaimed plant communities.*** Venting locations will need to be monitored by agency reclamation specialists to document the effects of venting on soil chemistry and vegetation of the surrounding area. Any significant changes in vegetation over time will determine the need for soil testing and analysis to determine the effect venting has had on soil chemistry. Mitigation Measure S-1, in Section IV.P. Potential Mitigation and Monitoring, has been developed to address this issue.

Wind erosion can be expected on exposed soils, although the potential for wind erosion is not considered to be of primary concern at the project site, when compared with the potential for water erosion (MDSL and BLM 1980). With or provide information to determine whether the dumps could indeed be successfully reclaimed at 2:1 slopes. MDEQ's preference for 3:1 slopes was based on the widely held premise that lesser slopes exhibit higher revegetation potentials due to lower potential erosion rates, enhanced equipment access/efficiency/safety factors, and greater precipitation infiltration leading to a more plant-amenable soil moisture regime. Erosion potential calculations also were completed by the MDEQ using the Universal Soil Loss Equation (USLE). The results of this modeling analysis indicated that 3:1 slope angles are less susceptible to erosion than 2:1 slopes, given assumed site-specific conditions (MDSL and BLM 1990).

GSM continues to reclaim waste rock dumps slopes under the existing reclamation plan and has entered into an extensive test plot program (Schafer and Associates 1995a) to determine the feasibility of successfully reclaiming 2:1 slopes, as well as to reduce the potential for waste rock dump effluent production. Demonstration plots were constructed, using appropriate techniques, on the West Waste Rock Dump in 1992 and on the East Waste Rock Dump (High Grade Waste Rock Dump) in 1991. With respect to test objectives, West Waste Rock Dump studies were designed to provide information related to 2:1 slope waste rock dump hydrology in light of applied revegetation techniques, while the East Waste Rock Dump study was constructed to evaluate grade control factors, capping techniques, and revegetation performance on a variety of slope angles. The capping techniques and waste rock sampling procedures, as well as the oxide cap characteristic criteria proposed as a part of the reclamation plan for this alternative (see Section II.B.1.b, Existing Reclamation Plan), were developed as a result of these studies.

The results of both studies are central to assessing the feasibility of successfully reclaiming 2:1 waste rock dump slopes. The feasibility of success may be best assessed in light of both the incidence of soil erosion and the establishment of vegetation communities with respect to the climatic conditions under which the studies were conducted. Through 1994, ***measured*** sedimentation rates for both 2:1 and 3:1 test plots on the West Waste Rock Dump were statistically comparable to natural rates from the 2:1 sloping Reference Area No. 3. Similarly, vegetation cover was measured on 2:1 slopes and found to have exceeded that of Reference Area No. 3 and to have surpassed the vegetation success criteria established for this project. The results of data analyses for the East Waste Rock Dump study are similar through 1994. ***Measured*** erosion rates between 2:1 and 3:1 test plots and Reference Area No. 1 were statistically comparable. Vegetation cover values for both 2:1 and 3:1 test plots exceeded those of Reference Area No. 1 for the 1992 and 1994 sampling dates.

The Revised Universal Soil Loss Equation (RUSLE) model was used as an adjunct analytical tool in combination with site specific data to assess the potential for erosion on 2:1 versus 3:1 slopes for this EIS. The parameters and data used in the model assumed that previously tested techniques, methods, and materials (including mulching) would be used during formal revegetation activities. The model was run for both slope angles using soil salvage information prepared for the West Waste Rock Dump. Two time frames were assumed: 1 year following revegetation to determine potential erosion rates following the first year of plant establishment and 5 years following revegetation to determine the potential for erosion from an established vegetation community. Two soil salvage scenarios also were evaluated. The first assumed that all available soil material suitable for salvage was stockpiled and spread prior to revegetation. This material contained a weighted average of 50 percent coarse fragments by volume. The second scenario assumed that only surface soils having less than 20 percent coarse fragments by volume were salvaged and reapplied during revegetation activities. The weighted average coarse fragment content by volume of this material was 7 percent. The MDEQ has set a value of 2 tons per acre as the maximum acceptable soil loss allowable. Appendix M depicts the values for the parameters used for all scenarios to complete this analysis.

2.1.2 Quality of Waste Rock Seepage

Because seepage from waste rock is not occurring presently, actual seepage cannot be measured. However, GSM has sampled porewater within the waste rock (see GSM, 1995). This porewater will migrate downward through the dumps and underlying vadose zone and will ultimately mix with the underlying groundwater. Analyses of porewater from reclaimed dumps, therefore, provide the best available estimate of long-term waste rock seepage quality. Detailed data for sulfate concentration of porewater samples is given in GSM (1995). Based on this data, sulfate concentration in reclaimed dumps varies from 26,300 to 37,500 mg/l. From this data, the EIS (Appendix J) assumes an average sulfate concentration of 30,000 mg/l in porewater from reclaimed dumps. For purposes of this mixing zone analysis a sulfate concentration of 30,000 mg/l is also assumed. Additional data on metal concentrations in porewater is summarized in Table 2-1.

2.1.3 Acid Rock Drainage Persistence

As discussed in Section 2.1.1, waste rock dumps are not currently releasing ARD to groundwater based on field evidence and predictive modeling. Seepage is not expected to occur from the Waste Rock Dumps for 50 to 350 years due to the low recharge rates associated with the final dump reclamation design (0.25 inches/yr.) and the huge volume of material through which the seepage must pass. Once seepage emerges from the bottom of the waste rock dumps it must pass through ~~an additional~~ ***a minimum of 100 to 200 feet, and locally over*** 300 feet of unsaturated Bozeman Group sediments before reaching the regional water table. ~~Travel times in excess of~~ ***Assuming an average depth to ground water of 200 feet beneath the waste rock dumps, travel times on the order of*** 800~~years~~have been predicted for seepage from the east dumps to reach groundwater (EIS Appendix J). ARD concentrations in seepage will be affected by attenuation and neutralization within the Bozeman, dilution in the regional groundwater system and additional dilution by precipitation recharge and dispersion as groundwater flows downgradient.

Golden Sunlight Mines, Inc.
Water Treatment Plant
Sludge Disposal

Introduction

Waste sludge from the water treatment plant will be dewatered using a filter press rather than relying on solar evaporation. This will reduce concerns associated with dust and pond leaks. Also, use of a filter press will provide a more manageable means of sludge disposal. Sludge will either be pumped with a high-solids slurry pump or trucked to a landfill disposal area located on the surface of Tailing Impoundment No. 2. Landfill cells will be provided with geomembrane liners. The tailing impoundment liner will provide a secondary leakage containment system.

Sludge Volume

Sludge volumes were estimated by Hydrometrics, Inc. ~~(Robert Kimball and Mark Reinsel, August, 1995~~ *Design and Estimated Costs for Water Treatment Plant at Golden Sunlight Mines, Inc., revised February 1998*). A sludge volume of ~~47~~ 68 cubic yards per day is expected. ~~from plant startup through year 10 and a sludge volume of 21 cubic yards per day is expected beyond year 10.~~ The dewatered sludge will have a minimum solids content of 50% by weight.

Sludge Disposal

At the landfill, sludge will be disposed of in thin lifts that will periodically be disked and will be allowed to dry to 20-25% moisture content. ~~These~~ *This is the Optimum Moisture Content (OMC) expected for optimal compaction results for this material.* Lifts will then be compacted to at least 90% relative density using a vibratory sheepsfoot compactor. Compacted sludge volumes will be ~~8.64~~ 33.5 cubic yards per day.~~in years 0 through 10 and 10.65 cubic yards per day beyond year 10.~~

A typical cross-section of a sludge disposal cell on the surface of Tailing Impoundment No. 2 is shown in Figure 1. Cells will be bounded by 24-foot high ~~compacted fill~~ berms *constructed of compacted fill material, and will be underlain by a high density polyethylene (HDPE) geomembrane liner.* Drainpipes will allow rain water to be drained to a reclaim pond. This water will then either gravity flow or be pumped back to the water treatment plant. ~~Active cells will be surrounded by wildlife control fences and reclaim ponds will be provided with bird netting.~~ At least two cells will be active at any time. ~~to~~ *This will* allow sludge disposal in one cell while the upper lift in the second cell is being disked, drying out or being compacted.

Storage Requirement

~~In years 0 through 10, two 164 foot square cells will be required. Beyond year 10, cells~~ *Sludge disposal* cells will be 200 feet square. Each cell will be filled until the sludge eventually reaches a depth of 20 feet. This corresponds to a storage capacity of ~~6 years~~ 884 days worth of sludge production per cell. The final surface area of Tailing Impoundment No. 2 will be 165.5 acres. This will provide adequate storage area for over ~~4,000~~ 282 years worth of sludge production. *When the entire surface has been covered with sludge disposal cells, a new layer of cells can be constructed on top of the original layer.*

Wildlife and Dust Control

Wildlife control fences will surround active cells, and reclaim ponds will be provided with bird netting. This will prevent exposure of wildlife and birds to the sludge and potentially acidic water that will drain off the facility. It will also prevent wildlife from damaging the geomembrane liner.

The minimum 30 percent moisture content of the sludge is expected to prevent dust formation. However, if dust does become a problem, a chemical soil-binding agent will proactively be applied to the surface of any areas that are dry enough to form dust.

Cell Closure

Prior to construction of a landfill cell, Impoundment No. 2 reclamation capping materials will be stripped and stockpiled. At cell closure, a geomembrane liner will be placed over the surface of the compacted sludge. The stockpiled capping materials will then be placed over the geomembrane and vegetation will be reestablished.

$$v = \frac{15 inches/yr \cdot 1.0}{0.26} = 57.7 inches/yr = 4.8 ft/yr$$

Water will seep much more slowly through unsaturated materials because hydraulic conductivity decreases dramatically as water content is reduced. The results of unsaturated flow modeling indicate that the volumetric water content of the Bozeman Formation would be 0.257, for the assumed material properties given above and an infiltration rate of 0.5 inch/year. The seepage velocity under these conditions is calculated as follows:

$$v = \frac{q}{\theta - \theta_r} = \frac{0.5 inch/yr}{0.257 - 0.092}\left(\frac{1 ft}{12 inches}\right) = 0.252 ft/yr$$

Assuming that the depth from the base of the waste rock dump to the water table is 200 feet, the time of travel from the dump base to the aquifer would be approximately 790 years. This result is sensitive to the assumed infiltration rate, and to the assumed moisture content of the soil profile at that infiltration rate. The method assumes that no preferential pathways exist, and that soil moisture movement occurs throughout the soil profile, which is considered to be a reasonable assumption for the site conditions.

West Dump Travel Times. Foundation conditions beneath the West Dump are significantly different from the East Dump conditions. The bedrock is overlain by a relatively thin veneer of gravelly soils beneath the dumps. It is assumed that seepage which infiltrates the West Dump waste piles in excess of ~~0.5~~ *0.8* inch per year will run off the shallow bedrock surface, and will not contribute to the groundwater recharge.

2.2.4 Time of Travel Summary

In summary, the time-of-travel through the waste rock dumps and vadose zone below the dumps was estimated based on predicted hydraulic properties of the materials, and assumed infiltration rates. For an infiltration rate of 0.5 inch per year, the simplified model predicted that approximately 200 years would be required to "wet" the dump to approximately 3 percent above its placement moisture, at which time moisture migration from the dump will commence. Approximately 600 years would be required to achieve this moisture condition throughout the dump material for an assumed infiltration rate of 0.25 inch per year. These values represent the total travel times for ARD on the west side which is not underlain by a thick layer of unsaturated sediments.

A steady-state calculation of the time-of-travel through the Bozeman Formation indicates that, at an infiltration rate of 0.5 inch/yr, approximately 800 years would be required for soil moisture to move from the base of the dump to the top of the water table, some 200 feet below. Therefore, at an infiltration rate of 0.5 inch/yr, the total travel time for ARD on the east side is on the order of 1,000 years.

2.3 Model Results for All Action Alternatives

The results of mixing cell simulations for all action alternatives are presented relative to three different rates of precipitation infiltration into waste rock dumps. These different infiltration estimates represent a bracketed measure of the success of reclamation practices at the Golden Sunlight Mine. The three infiltration rates for dump surfaces considered in the mixing cell model are

MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY

STATEMENT OF BASIS
(for proposed mixing zone)

PERMITTEE: Golden Sunlight Mines, Inc., Operating Permit No. 00065

RECEIVING WATERS: Bozeman Unit Aquifer, West Side Bedrock Aquifer, and Jefferson River Alluvial Aquifer

IV POTENTIAL MITIGATION AND MONITORING

The following proposed mitigation and monitoring measures have been developed to reduce potentially adverse impacts. These are in addition to the existing and proposed environmental protection measures outlined in Chapter II of the Draft EIS.

IV.A Geology, Minerals, and Paleontology

Issue: Future slide block movement.

Measure G-1: Geodetic monitoring programs to detect ground movements associated with the landslide blocks at Golden Sunlight Mine are described in the Operating Permit. This measure is currently in place and would be continued for all alternatives. Current reporting is on a monthly basis. In addition to geodetic monitoring, the mine also monitors inclinometers and piezometers. These data are reported annually. If any new movement of the slide blocks is detected, the appropriate agencies would be notified promptly, and monitoring intervals and reporting frequencies increased as appropriate. Protocols have been developed for actions to be taken if renewed ground movement is detected.

Agency notification and review of block stability will occur if any of the following criteria are exceeded:

- An average groundwater increase in the Bozeman Unit within the Sunlight Block of greater than 1 foot during any 1-month period;

- A cumulative, average groundwater level increase of 10 feet in the Bozeman Unit within the Sunlight Block, with respect to November 1994 levels;

- If movement is indicated by inclinometers located within the Sunlight Block; or

- If consistent movement trends are discernible from geodetic monitoring data over a period of 2 months or more.

Effectiveness: This measure would provide for detection of any further ground movements in the identified slide block areas. If movement is detected, appropriate mitigation measures could be taken to re-establish stability. Such measures could include, redistribution of waste rock, dewatering, recontouring, and buttress construction in slide areas. These measures were used to successfully address the slide block movements experienced in 1994.

Application: This measure would apply to all alternatives, including the No Action Alternative.

Issue: Potential ground movements in the East Waste Rock Dump.

Measure G-2: Geodetic monitoring programs to detect ground movements associated with the East Waste Rock Dump areas would be implemented, similar to those currently used at the existing slide block area and described in the Operating Permit. If any ground movements are detected, the appropriate agencies would be notified promptly, and monitoring intervals and reporting frequencies would be increased as appropriate. Protocols would be developed for actions to be taken if ground movement is detected, similar to those outlined in Measure G-1.

Effectiveness: This measure would provide for detection of any ground movements in the East Waste Rock Dump. If movement is detected, appropriate mitigation measures could be taken to re-establish stability.

Application: This measure would apply to all alternatives except the No Action Alternative.

Issue: Movement of structural foundations.

Measure G-3: Early warning of plant site movement is being provided by Sunlight Block monitoring, (Measure G-1). A stability monitoring program for the ore processing facilities also has been initiated. In addition to the primary (Sunlight Block) movement monitoring, ore processing facilities are monitored as follows:

- Weekly monitoring of all reagent tanks and critical mill components with 76 EL Beam

Tailing impoundment No. 2 was constructed with a liner that prevents discharge to groundwater, therefore a mixing zone is not required for this facility.

Based on groundwater monitoring data (GSM, 1998), the waste dumps are not currently discharging to groundwater. However, modeling of moisture migration through the dumps (DEQ and BLM, 1998, App. J) predicts that infiltrating moisture from the dumps could discharge to groundwater at some time in the future. Estimates of the time at which seepage could occur vary from several tens to several hundreds of years. A portion of the seepage from the west dumps will be captured either in drains or groundwater capture wells and routed to the water treatment plant. Seepage from the east dumps will enter the underlying groundwater system where acidity sensors. Movement data are collected from each sensor on a weekly basis.

- Weekly monitoring of concrete slabs and foundations using extensometers installed throughout the mill, shops, crushers, and plant site.
- Monthly optical level surveys of the grinding mill pedestals.

These measures would be continued. If adverse movement is detected, the appropriate agencies would be promptly notified, and appropriate steps taken to ensure the safety of employees and protection of the environment.

Effectiveness: This measure would provide for detection of any movements within the ore processing facilities area. If movement is detected, appropriate mitigation measures could be taken to re-establish stability. Such measures could include draining of processing fluids to the tailings impoundments, and structural refitting of facilities to accommodate movements. These measures were used to successfully address the movements experienced in 1994.

Application: This measure would apply to all alternatives, including the No Action Alternative.

Issue: Damage to tailings impoundment caps due to consolidation settlement.

Measure G-4: ***Tailings impoundment consolidation over time,*** could result in differential settlements of the impoundment reclamation caps. Such differential settlements could cause ponding of surface water or disturbance of the cover in such a way as to reduce the cover effectiveness in preventing infiltration. Such damage can be mitigated by maintenance activities which would include regrading of the impoundment surface in affected areas, and repair of the cover as needed to restore its function and maintain the desired slopes on the impoundment surface.

Effectiveness: Maintenance activities performed as needed to the impoundment surface and the tailings caps would be effective in maintaining cover integrity and function.

Application: This measure would apply to all alternatives, including the No Action Alternative.

Issue: Construction feasibility concerns regarding pit backfilling activities under the Partial Backfill Alternative.

Measure G-5: Worker safety and stable cover of pit wall surfaces are concerns for the proposed placement of backfill in the pit under the Partial Backfill Alternative. In order to address these concerns, an evaluation would be made of potential alternatives for construction. Such construction alternatives could include the following:

- Construction of the pit wall backfill by working up from the bottom of the pit, rather than end dumping. While this option would result in placement of a more consistent fill with reduced risk to workers, it would require greater volumes of backfill material against the pit walls (up to 5 or 6 times as much), and may be cost prohibitive; or
- Use of remote-controlled equipment for grading of the pit wall cover slopes, to avoid safety risks to workers.

Effectiveness: Alternative construction methods would likely entail considerable additional costs, and would not likely be cost-effective in producing a reliable long-term reclamation plan.

Application: This measure would apply to the Partial Backfill Alternative.

Issue: Direct impacts to previously unidentified paleontological resources.

Measure P-1: If previously undocumented paleontological deposits are located during project operations, GSM would cease activities in the area until the resources could be examined by professional paleontologists approved by the state and/or BLM. If significant paleontological resources are economically feasible source for municipal and domestic water supplies. Class III groundwaters have specific conductivities ranging from 2500 to 15,000 micromhos/cm at 25 degrees C [ARM 17.30.1002(2)(c)].

2. *(Downstream effects)* Impacts to the Jefferson River have been addressed in the EIS. The analysis concludes that the river would not be impacted from mine discharges because of its distance from the facility and the lack of a direct hydrologic connection between discharging groundwater and surface water.

3. *(New or increased source)* This significance determination is made pursuant to the current

identified, impacts would be mitigated through an appropriate treatment plan approved by the state and/or the BLM, or through site avoidance.

Effectiveness: This measure would allow for the evaluation of previously unknown and potentially significant paleontological deposits that may be discovered during mining activities. It also would provide adequate time for presentation and recovery of the resources if this is deemed necessary by the state or BLM.

Application: This measure would apply to all alternatives.

IV.B Water Resources

Issue: Identification and replacement of reduced discharge or reduced water quality at springs and seeps.

Measure W-1: A monitoring program would be established to quantify discharge and water quality at springs in the project area, and to identify any reductions in flow or water quality. Data collection events would be frequent enough to detect spring response to seasonal variations and pit dewatering.

Mitigation of reduced discharge at springs would *include*: 1) further development of the *affected* spring *by improving collection and storage of spring discharge and/or expanding the interception area of the spring at the water table and/or,* 2) diverting water from the *dewatering wells upgradient of the pit (provided the water is of suitable quality)* or permanent water treatment plant *to create or enhance additional water resources* for wildlife and livestock use.

Reduced water quality would be *mitigated* by establishing additional water sources for wildlife and livestock use. Additional water sources would be obtained from treated water discharged from the permanent water treatment plant, *or from water discharged from dewatering wells upgradient of the pit (depending on water quality). The supplemental water used to mitigate potential impacts will meet the water quality criteria applicable to the downgradient beneficial uses and will be discharged under appropriate Montana regulatory requirements.*

Effectiveness: This measure would document variations in spring discharge and spring water quality and provide data to determine if changes in spring flows or water quality are occurring as the result of mining activities. This measure also would provide continued surface water sources at the mine site, greatly reducing impacts to wildlife and livestock.

Application: This measure would apply to all alternatives.

Issue: Pit groundwater discharge to adjacent hydrostratigraphic units.

Measure W-2: Pit pond water levels would be monitored to ensure that the pit pond elevation remains below the groundwater discharge threshold elevation of 5,050 feet. If the pit pond level exceeds elevation 5,050 feet, appropriate measures would be taken to reduce the pond level. Such measures would include additional pumping and/or water treatment facilities.

Water level and water quality downgradient of the pit also would be monitored to confirm that a maximum pond elevation of 5,050 is effective in eliminating pit discharge to adjacent stratigraphic units. The 5,050 elevation was derived from modeling studies, and the appropriateness of this estimate should be verified. Such monitoring would indicate if adjustments are needed to this proposed maximum pond elevation in order to protect groundwater outside the pit.

Effectiveness: This measure would prevent pit pond water levels from exceeding the threshold discharge elevation, and thus mitigate the potential for degradation of the surrounding groundwater.

Application: This measure would apply to all alternatives where ponding in the pit would occur. This measure also would apply to the Partial Backfill Alternative, which would require maintaining the groundwater surface at or below elevation 5,050 although no open pond would remain in the pit. Monitoring of groundwater levels would be done via monitoring wells instead of pond level.

Issue: Erosion from increased flows in stream channels due to the Sheep Rock or return diversion.

Measure W-3: Under the Proposed Action, increased erosion could occur within Conrow Creek and the tributary to Conrow Creek following the introduction of additional flows from Sheep Rock Creek. Under the Return Diversion Alternative, increased erosion could occur within the unnamed tributary to Sheep Rock Creek as a result of diverted flows. Periodic examination of these channels and maintenance would be performed. Maintenance would include the addition of erosion protection in affected channel reaches, and/or installation of check dams or other grade control structures. GSM has committed to visually inspecting Conrow Creek after storm events and addressing channel damage. This would apply for the unnamed tributary to Sheep Rock Creek under the Return Diversion Alternative.

Effectiveness: Periodic examination of channels and maintenance as needed would mitigate erosion from increased flows in Conrow Creek, the tributary to Conrow Creek, or the unnamed tributary to Sheep Rock Creek.

Application: This measure would apply to the Proposed Action, and to other alternatives which would include the diversion of Sheep Rock Creek into Conrow Creek; this measure would apply to the Return Diversion Alternative for the unnamed tributary to Sheep Rock Creek.

Issue: ARD release from waste rock dumps that is either premature because of transport along preferential, discrete flow paths, and/or of greater flow rate than modeled performance because of higher than expected infiltration.

Measure W-4: If the data from existing monitoring wells and/or spring flows indicate that changes in water quality are occurring which are likely to exceed applicable regulatory requirements, the following mitigation measures would be employed:

a) If water quality impacts are detected in monitoring wells at the mixing zone boundary downgradient from the East Waste Rock Dump, localized capture of groundwater may be needed to contain ARD transport along preferential, discrete flow paths that were not anticipated by the ARD fate and transport model (see Appendix J). A groundwater capture system similar to the system described in Appendix A for the West Waste Rock Dump would be installed. Capture of discrete plumes from the East Waste Rock Dump would not require a well system as extensive as assumed for the West Waste Rock Dump. The contingency design in Appendix A that provides for treatment of approximately 20 percent of the predicted flux on the east side is considered adequate for this mitigation measure.

b) ARD-impacted seeps may emerge at the toes of the dumps where preferential drainage paths occur within the dumps that lead to discrete "perched" saturated zones at their base. *Additional shallow monitoring wells would be placed in all topographically evident drainages down gradient of the waste rock dumps. If water quality impacts are detected in any of these shallow wells,* shallow groundwater capture systems such as toe drains would be installed within the *impacted drainages* to supplement the primary, deep capture well system. *Shallow capture wells would be permitted as an alternative to toe drains in the larger, deeper drainages such as the Sheep Rock Gulch and the Rattlesnake drainage down gradient from the Easte Waste Rock Dump. Toe drains must extend completely through the surficial alluvial materials to bedrock in the West Waste Rock Dump area, and toe drains or capture wells must extend through the alluvial/colluvial materials to the underlying Bozeman sediments down gradient from the East Waste Rock Dump. Water collected in the toe drains and capture wells would be conveyed by gravity flow pipelines to the* *water treatment plant, or to a centralized sump area from which collected water would be pumped to the treatment plant; or*

c) *In situ* treatment systems would be installed in the shallow ("perched") aquifer zones, including the alluvial materials over bedrock on the west side, and/or the colluvial/alluvial materials in Rattlesnake Gulch or at other locations downgradient of the East Waste Rock Dump. One example of this type of emerging technology is a funnel and gate approach which incorporates groundwater barriers that "funnel" the identified contaminant plume(s) through constrained location(s) within the shallow aquifer. *In situ* reaction walls, such as limestone-filled trenches, are installed at these "gate" locations. The reaction walls provide essentially "semipervious" barriers which allow water to pass but "filter" the dissolved metals or other contaminants.

Effectiveness: The supplemental groundwater capture systems described would allow interception of contaminated groundwater that bypasses the primary capture well system. ARD-impacted groundwater could bypass the capture wells along shallow perched flow paths around the peripheries of all the dumps, or move through high conductivity preferential flow paths downgradient from the East Waste Rock Dump. The supplemental systems described will provide for capture of these potential ARD sources before the contaminated water migrates downgradient to beneficial uses, or to sensitive receptors, such as the Jefferson River.

Application: These measures would apply to all alternatives.

Issue: Impacts to beneficial uses of water downgradient of capture system because of capture. drawdown effects.

Measure W-5: *The aquifer would be recharged downgradient of the capture system using water treatment plant effluent and/or water discharged from dewatering wells upgradient of the pit; and/or these water sources would be discharged as surface water within the mining zone boundaries in a manner that provides for wildlife/livestock beneficial use.*

Effectiveness: This measure would minimize impacts to beneficial uses of water downgradient of the groundwater capture system.

Application: This measure would apply to all alternatives.

Issue: Total of combined inflows to permanent water treatment plant exceed the capacity of the plant.

Measure W-6: The capacity of the permanent water treatment plant would be reevaluated and incorporated into the final design within two years prior to mine closure. At that time, the actual rate and quality of pit inflow during peak flow and low flow periods, and the total rate and quality of groundwater captured in the tailing area will be better known.

Based on the degree of uncertainty of the rate of inflow from future sources, a contingency measure of up to 25 percent additional flow would be incorporated into the treatment plant capacity, and a contingency to provide storage for up to 6 months of anticipated water inflow would be included. This would provide for time to modify the plant if needed for unanticipated future inflows.

Alternatively, a new, additional water treatment facility would be constructed to address treatment of a specific source or sources. This supplemental water treatment facility would be built at the time such sources are identified. This alternative measure may be considered for treatment of waste rock dump ARD because the time frame before ARD impacts are anticipated to occur is longer than a reasonable design life of the permanent water treatment plant that will be built at the end of mining.

Effectiveness: Sufficient additional water treatment capacity, whether added to the permanent water treatment plant design or as an additional separate facility, would provide for treatment of unanticipated inflows.

Application: This measure would apply to all alternatives.

Issue: Cracking of tailings impoundment covers due to dislocation and/or freeze-thaw effects.

Measure W-7: The 18-inch clay layer of the cover for Tailings Impoundment No. 1 would be replaced with an additional 18 inches of agency-approved alluvial borrow material. The additional 18-inch layer of alluvial borrow material is not needed for the lined Tailings Impoundment No. 2.

Effectiveness: Field studies indicate that this will enhance the cover system over the unlined Tailings Impoundment No. 1 and help to minimize the seepage that needs to be collected and pumped back for treatment.

Application: This measure would apply to the No Action Alternative. All other alternatives utilize the cover described in this mitigation measure, substituting local borrow for the clay layer.

Issue: Leakage from HDPE liner system underlying Tailings Impoundment No. 2 and reclaim ponds.

Measure W-8: If the data from existing monitoring wells indicate that the Tailings Impoundment No. 2 and/or reclaim ponds liners are leaking, pumpback wells would be installed as needed to effectively contain any impoundment fluid plumes. It is anticipated that pumpback systems installed to contain Tailings Impoundment No. 2 leaks would require similar pumpage rates per well as are currently being used for pumpback groundwater control at Tailings Impoundment No. 1. However, it is unlikely that as many wells would be needed as are in operation on Tailings Impoundment No. 1 because the leakage from Tailings Impoundment No. 2 is likely to be localized, the underlying compacted clay materials have very low permeabilities, and the hydrogeologic conditions under Tailings Impoundment No. 2 are more favorable. The pumpback flows would have to be treated in an enlarged or supplemental water treatment facility, as described under Mitigation Measure W-7.

Effectiveness: Groundwater interception and pumpback have been shown to be effective for controlling seepage from Tailings Impoundment No. 1, and would likely also be effective for containing leaks from Tailings Impoundment No. 2 and/or the reclaim ponds.

Application: This measure would apply to all alternatives.

Issue: Preventing contact between natural groundwater and tailings material in Tailings Impoundment No. 1 in order to reduce or eliminate the mobilization of cyanide, TDS, and ARD constituents.

Measure W-9: Prior to mine closure, a trench-drain upgradient of Tailings Impoundment No. 1 would be constructed within the Rattlesnake hydrostatic unit, the known source of water to the historic spring at the north end of the impoundment. The trench drain would be designed to intercept between 20 and 30 percent (40 to 60 gpm) of the estimated Rattlesnake unit groundwater flux (200 gpm) and route this water by gravity drainage to a percolation pond away from the impoundment area. This measure would lower the groundwater table within the Rattlesnake unit downgradient of the drain and beneath the former spring area such that the hydraulic contact between groundwater and tailings is eliminated. The success of this system would be monitored for a sufficient amount of time prior to mine closure so that the results could be incorporated into the final design of the water treatment plant.

Alternately, one or more dewatering wells could be constructed through the tailings impoundment and into the underlying Rattlesnake unit in the former spring area.

Effectiveness: A trench-drain upgradient of Tailings Impoundment No. 1 would reduce the groundwater flow beneath the impoundment, reducing the amount of cyanide, TDS, and ARD constituents that could be mobilized in groundwater beneath the impoundment.

Application: This measure would apply to all alternatives.

Issue: Identification of bedrock fractures to optimize efficiency of the west side groundwater capture system.

Measure W-10: A hydrogeologic investigation of the bedrock hydrostratigraphic unit on the west side of the project area would be conducted to identify major water-bearing fractures for purposes of monitoring and future groundwater capture of dump seepage. The study would be comprised of geologic mapping, test well drilling, and aquifer testing. The results of the study would be used to determine optimum groundwater monitoring locations and to design a groundwater capture system to prevent impacts to beneficial water uses.

Effectiveness: A hydrogeological investigation to identify major water-bearing fractures on the west side of the project area would increase the efficiency of the proposed groundwater capture system that is designed to prevent impacts to beneficial water uses.

Application: This measure would apply to all alternatives.

Issue: Damage to the permanent diversion of Sheep Rock Creek at less than the design flows (one-half PMF), exposing waste rock to surface water flows.

Measure W-11: Any damage which occurs to the permanent diversion channels during flow events less than the designated design flow criteria would be monitored during scheduled operational inspections. Any such damage would be repaired as part of scheduled operational maintenance activities, restoring the affected channel reaches to their original capacity and condition.

Effectiveness: Scheduled inspection and maintenance of permanent diversion channels would allow timely repair of any damage to channels which could compromise their intended performance.

Application: This measure would apply to all alternatives which utilize permanent diversion of Sheep Rock Creek.

IV.C Soils and Reclamation

Issue: Effects of steam venting on soils and vegetation of reclaimed waste rock dump surfaces.

Measure S-1: A program for the continued monitoring of *reclaimed waste rock dumps (including test plots)* to further assess the impacts, if any, that steam venting may have on reapplied soil or establishing vegetation would be implemented. The program would consist of GSM or agency reclamation specialists annually monitoring the number, location, size, *and gas emissions* of steam vents and extent of modified plant communities surrounding vent locations. If detrimental effects to establishing vegetation communities are observed on more than 0.1 percent of the total reclaimed area covering acid-producing materials, GSM would be required to: 1) rock armor vent locations to prevent erosion and spreading of vent locations, 2) sample and test soils at vent locations, and 3) prepare a detailed plan to further reduce the expansion of steam vents and minimize potential impacts to reclamation success. Soil parameters to be tested would correspond to those which appear to have given rise to the change in vegetation communities. At a minimum, soil pH and ABA should be evaluated for each sample collected. The general cost for such a program should be included in a post-mine maintenance bond.

Effectiveness: This would be an effective means of assessing and mitigating the changes occurring, if any, through time to reapplied soil materials and vegetation communities as a result of steam venting. The results of testing would be directly applicable to assessing whether steam venting had a negative effect on establishing vegetation communities.

Application: This measure would apply to all alternatives.

Issue: Salvaging or providing a sufficient volume of oxide rock, soil, or borrow material for capping needs under the No Action Alternative.

Measure S-2: GSM would include in its bond *submittal, funds providing* for the salvage of a sufficient volume of oxide rock, soil or borrow material to make up for the projected shortfalls of suitable capping material under the No Action Alternative. The calculations *for the bond* would be based on the volume of capping material needed, the volume of material available from various sources, and the distance to the two to three closest sources of oxide rock, soil, or borrow material to account for a reasonable haulage factor.

Effectiveness: High in terms of providing for sufficient capping needs and promoting reclamation potential.

Application: This measure would apply to the No Action Alternative only.

Issue: Salvaging a sufficient volume of soil (or borrow material) for reclamation under the No Action Alternative and Divided Dump Alternative (minimum disturbance scenario).

Measure S-3: The agency engineer would identify which soil stockpiles and which areas to be resoiled would be affected by the projected soil or borrow material shortfall. Continuing agency review of annual mine reports would provide the basic information with which to identify projected shortfalls. A salvage area would be identified and a bond calculation made to recover the needed volume of soil or borrow material at the time of reclamation. GSM would include in *its* bond *submittal, funds providing* for *the salvage of* a sufficient volume of soil material to make up for the projected shortfalls under either alternative. The calculations *for the bond* would be based on the volume of soil needed, the volume of soil available from various material sources, and the distance to the two to three closest sources of soil (or borrow) material to account for a reasonable haulage factor.

Effectiveness: High in terms of providing for sufficient bond funds to address the soil volume shortfalls.

Application: This measure would apply to the No Action Alternative and Divided Dump Alternative (minimum disturbance scenario).

Issue: Providing for application of soils containing high (up to 50 percent by volume) rock fragment contents on 2:1 and 3:1 waste rock dump slopes as a part of the reclamation cap proposed for waste rock dumps.

Measure S-4: Based on the results of on-site studies, GSM would use soils containing high (up to 50 percent by volume) rock fragment contents as part of the reclamation cap proposed for waste rock dumps. A combination of alternate erosion control techniques may be used in lieu of the proven high rock fragment content soils, if it can be shown that the substituted technique(s) will provide the same effect with regard to reducing erosion potentials on reclaimed slopes.

Effectiveness: High in terms of reducing erosion potentials for reclaimed areas, particularly steep slopes.

Application: This measure would apply to all alternatives.

Issue: Providing for mulch or a "mulch effect" as a part of the revegetation sequence proposed for disturbed areas during the reclamation phase of this project.

Measure S-5: Based on the results of on-site test plot studies, GSM would include mulching as part of the revegetation technique sequence proposed for disturbed areas at the project site. A combination of alternate mulching, cover crop, or seedbed manipulation techniques may be used in lieu of the proven mulching technique, if it can be shown that the substituted technique(s) will provide the same effect with regard to reducing erosion potentials and increasing revegetation success.

Effectiveness: High in terms of increasing revegetation success potential for disturbed areas, particularly steep slopes.

Application: This measure would apply to all alternatives.

Issue: Long-term success of waste rock and tailings revegetation using oxide waste rock and borrow material capping.

Measure S-6: The evaluation of existing waste rock test plots (initiated by Schafer and Associates) to assess the effectiveness of waste rock capping techniques developed on site would be continued until instrumentation ceases to function. Monitoring in this regard would consist of annually assessing the pH, NAG pH and ABA of the soil, soil/oxide cap transition zone, oxide cap, oxide cap/unoxidized waste rock transition zone, and unoxidized waste rock "horizons" to a sufficient depth (40 to 48 inches) to determine whether detrimental changes in these parameters are occurring within the root zone through time. Plant cover and species composition assessments would continue. Estimates of erosion also would be included based on soil surface features such as rilling, pedestaling, etc. A similar but abbreviated monitoring effort would be conducted at the tailings facility and selected waste rock dump sites to assess the potential for capillary rise from the tailings into the reapplied soil materials and acidification of reapplied soil over waste rock, respectively. The length of time that monitoring should continue would be decided upon by *the agencies based on monitoring results and trend analysis.*

Effectiveness: This would be a highly effective means of assessing the changes, if any, in seedbed materials through time as a result of the chemical characteristics of the material over which the soils were applied.

Application: This measure would apply to all alternatives.

Issue: Reducing erosion potential on reclaimed slopes by reducing slope length between benches.

Measure S-7: Slope length would be reduced from 200 to 100 vertical feet between benches. This would reduce slope length to 225 feet on 2:1 slopes and 320 feet on 2:1 slopes. This would apply to all slopes regardless of gradient. Currently reclaimed areas would not be changed unless erosion proves to be a future problem. Other measures could be added to existing reclaimed slopes, such as additional surface rock mulches, rock breaks applied on slopes, etc., to produce the same effect as additional benches.

Effectiveness: This would reduce the erosion potential on reclaimed slopes and would also allow for additional access to maintain slopes, if needed.

Application: This measure would apply to all alternatives.

IV.D Vegetation and Wetlands

No mitigation measures are proposed for vegetation. See Appendix N for a detailed description of wetland mitigation measures.

IV.E Wildlife and Fisheries Resources

Issue: Potential bat and avian contact with poor quality pit water.

Measure WF-1: When the pit lake forms, a monitoring program would be implemented to determine whether bat and avian species are utilizing the poor quality pit water for foraging or other activities. If this is occurring, a hazing program similar to that used for the tailings impoundments would be developed and implemented.

Effectiveness: This measure would minimize impacts to bat and avian species from contact with poor quality pit water.

Application: This measure would apply to all alternatives except the No Pit Pond and Partial Backfill Alternatives.

Issue: Loss of potential bat habitat.

Measure WF-2: An inspection or survey of existing mine shafts and adits would be conducted prior to initiation of mining activities to determine bat occupancy. GSM would notify the BLM prior to closing any shafts, adits, or man-made structures on BLM-managed land during mine operation. BLM would determine whether additional protection measures are necessary to prevent impacts to bat species that may inhabit these areas.

Effectiveness: These measures would prevent any direct impacts to bat species that may occupy abandoned underground openings. Long-term, indirect impacts would still occur.

Application: This measure would apply to all alternatives, except the No Action Alternative.

Issue: Loss of raptor nesting habitat.

Measure WF-3: Raptor surveys would be conducted during the breeding season prior to the initiation of mining activities on previously undisturbed lands between March 1 and August 15. If an occupied breeding territory or active nest site is located, restrictions would be applied to all disturbance activities during the breeding season. Protection measures would be identified by the agencies to protect breeding raptors. Depending on the nest location in relation to the planned mining activities, protection measures may include construction constraints within 0.5 mile of the nest during the sensitive early periods of the breeding season (e.g., courtship and incubation). The historic raptor nest located north of the tailings impoundment should be avoided. If it cannot be avoided this nest should be removed outside the active breeding season (March 1 to August 15).

Effectiveness: Surveys would determine the potential for impacting breeding raptors during nesting, and the appropriate protection measures would prevent disturbance of breeding birds. Nest removal outside the breeding season would minimize the loss of annual productivity for breeding raptors.

Application: This measure would apply to all alternatives, except the No Action Alternative.

Issue: Loss of migratory bird nesting habitat.

Measure WF-4: Removal of native vegetation species on previously undisturbed lands in the project area would be prohibited between May 1 and July 31 to protect actively nesting migratory birds. As an option, breeding bird surveys approved by the agencies could be conducted during the breeding season and prior to site disturbance to identify whether occupied territories or active migratory bird nest sites could occur within the areas to be disturbed. If nesting migratory birds are not located during the survey, construction could proceed. If nesting migratory birds are found, GSM would coordinate with the agencies and, based on the bird species detected, the agency biologist would make recommendations on whether appropriate protection measures should be implemented (e.g., avoidance).

Effectiveness: Constraint periods for removal of native trees and shrubs would minimize the direct loss of migratory birds. Breeding bird surveys would identify any sensitive migratory bird breeding areas prior to site disturbances.

Application: This measure would apply to all alternatives, except the No Action Alternative.

IV.F Threatened, Endangered, and Candidate Species

See Measures WF-1 and WF-2 in Section IV.E.5, Wildlife and Fisheries Resources.

IV.G Air Quality

No mitigation measures are proposed for this resource.

IV.H Land Uses and Plans

No mitigation measures are proposed for this resource.

IV.I Aesthetic Resources

IV.I.1 Visual Resources

No mitigation measures are proposed for this resource.

IV.I.2 Noise

No mitigation measures are proposed for this resource.

IV.J Social and Economic Resources

No mitigation measures are proposed for this resource.

IV.K Hazardous Materials and Wastes

Issue: Generation of unnecessary hazardous waste due to spills of hazardous materials onto soils.

Measure HM-1: Mitigation of the amount of soil impacted and removed due to a spill of hazardous material could be accomplished by storing all hazardous materials in a berm lined with an impermeable layer, rather than a soil or gravel berm. Spills within the containment berm would then be recovered with a vacuum truck and either recycled or disposed of consistent with *HWMA requirements.*

Effectiveness: This measure would reduce the impacts due to spills around tanks and storage vessels.

Application: This measure would apply to all alternatives.

Issue: Generation of unnecessary hazardous waste due to drainage from routine maintenance operations.

Measure HM-2: Mitigation of the amount of soil impacted and removed due to the drainage of areas such as equipment/truck wash stations and equipment maintenance facilities would be accomplished by means of collecting and draining all washout/runoff from the area into an oil/water separator before discharge to surface waters. Paving these areas such that washout/runoff collected in a central drain also would eliminate the impact to soil. Used oil sludge would then be recovered with a vacuum truck and either recycled or disposed of consistent with *HWMA requirements.*

Effectiveness: This measure would reduce the impacts due to the uncontrolled runoff of equipment wash rinsate.

Application: This measure would apply to all alternatives.

Issue: Generation of unnecessary hazardous waste due to improper handling and/or response to hazardous material spills.

Measure HM-3: Mitigation of the impacts due to a minor spill of hazardous material would be accomplished by training all personnel in the proper reporting and response requirements. Rapid and appropriate response to minor releases of hazardous material would reduce the amount of soil and/or water that would be impacted. Requiring all personnel to have OSHA hazardous material training would reduce the chance of accidents in storage and transport of hazardous materials and increase overall safety.

Effectiveness: This measure would increase worker awareness of hazardous material dangers and reduce the impacts due to spills.

Application: This measure would apply to all alternatives.

IV.L Cultural Resources

Issue: ***Direct impacts to known cultural resources.***

__Measure C-1:__ Data recovery would be conducted at NRHP sites eligible under criteria "d" directly impacted by mining activities and would be carried out in accordance with a formal treatment plan prepared by a professional archaeologist and approved by the BLM, the MDEQ, the SHPO, and the ACHP prior to project commencement. Mitigation for directly affected sites eligible to the NRHP under criteria a, b, and c also would be addressed in a treatment plan.

__Effectiveness:__ This measure would mitigate adverse effects from direct impacts through data recovery, collection of available site information, and educational measures as determined on a site by site basis, and would meet legal requirements under 36 CFR 800.

__Application:__ This measure would apply to all alternatives.

Issue: ***Indirect impacts to cultural resources from mining activities.***

__Measure C-2:__ Mitigation of indirect impacts would be accomplished by limiting access to archaeological sites on private land, education of GSM employees as to the fragile nature of cultural resources, and a strict GSM management policy regarding casual collecting of artifacts from project lands.

__Effectiveness:__ This measure would reduce, but not eliminate, indirect impacts to cultural resources on both public and private lands.

__Application:__ This measure would apply to all alternatives.

Issue: ***Surveying of project areas previously uninventoried.***

__Measure C-3:__ Class III surveys by qualified archaeologists would be conducted in those areas of Section 28 that have not been previously inventoried if disturbance in those areas is planned. Surveys would occur before disturbance and before issuance of the ROD. Any potential effects to sites identified in these areas would be considered through the Section 106 process.

__Effectiveness:__ This measure would identify and assist in mitigating adverse effects to currently unidentified sites that may occur in the unsurveyed areas.

__Application:__ This measure would apply to the Divided Dump Alternative.

IV.M Native American Concerns

Issue: ***Consultation on previously unidentified sites of potential significance to Native Americans.***

__Measure NA-1:__ If Class III surveys con[illegible] Section 28 (see Measure C-3) identify s[illegible] potential concern to Native Americans, [illegible] tribal representatives would be consulte[illegible] determine if the sites should be considered as important traditional cultural properties, and if so, to further determine the appropriate mitigation measures to avoid adverse impacts.

__Effectiveness:__ This measure would assist in identifying and mitigating adverse effects to currently unidentified sites that may be of significance to Native Americans.

__Application:__ This measure would apply to the Divided Dump Alternative.

APPENDIX 1

STATEMENT OF BASIS FOR PROPOSED MIXING ZONE

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MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY

STATEMENT OF BASIS
(for proposed mixing zone)

PERMITTEE: Golden Sunlight Mines, Inc., Operating Permit No. 00065

RECEIVING WATERS: Bozeman Unit Aquifer, West Side Bedrock Aquifer, and Jefferson River Alluvial Aquifer

FACILITY LOCATION: Jefferson County

A. PROPOSED ACTIVITY

Facilities at the Golden Sunlight Mine (GSM) such as waste rock dumps, tailings impoundment, and water treatment plant discharges, have resulted or could result in discharges to groundwater. In accordance with Montana Groundwater Regulations [ARM 17.30.1022 (1) (m)], these groundwater discharges are exempt from discharge permit requirements of the Montana Groundwater Pollution Control System (MGWPCS). However, Montana Water Quality Standards [ARM 17.30.1003], Nondegradation Rules [ARM 17.30.701], and Mixing Zone Rules [ARM 17.30.501] are applicable to the discharges. Discharges to groundwater are allowed through GSM's Hard Rock Mining Operating Permit and amendments. This Statement of Basis analyzes water quality changes from the proposed source specific groundwater mixing zone that is designed to encompass previously permitted facilities, the existing discharge from tailings impoundment No. 1 as well as the facility expansion under Amendment 10 and potential future discharges.

A mixing zone is designated that will encompass three sources of discharges from the mine. Tailings impoundment No.1 was commissioned in 1983 and designed as a free draining facility with a seepage capture and containment system consisting of a slurry cut-off wall and pumpback wells. A deficiency in slurry wall construction resulted in the release of cyanide to the downgradient groundwater system. A capture system was constructed soon after the release to limit the migration of seepage. The capture system has effectively controlled tailings seepage and continues to be operated. Dewatering and reclamation of the impoundment is expected to minimize seepage to less than 10 gpm over the long term.

Tailings water in impoundment No. 1 is presently neutral to alkaline due to residual mill processing reagents and contains cyanide and metals. Because of the acid generating nature of the tailings, it is predicted that eventually the tailings water will become acidic with a composition similar to the pit water (high metals, low pH). At the same time cyanide will decrease. GSM will maintain the existing pumpback system to recover acidic seepage from the impoundment.

Tailing impoundment No. 2 was constructed with a liner that prevents discharge to groundwater, therefore a mixing zone is not required for this facility.

Based on groundwater monitoring data (GSM, 1998), the waste dumps are not currently discharging to groundwater. However, modeling of moisture migration through the dumps (DEQ and BLM, 1998, App. J) predicts that infiltrating moisture from the dumps could discharge to groundwater at some time in the future. Estimates of the time at which seepage could occur vary from several tens to several hundreds of years. A portion of the seepage from the west dumps will be captured either in drains or groundwater capture wells and routed to the water treatment plant. Seepage from the east dumps will enter the underlying groundwater system where acidity and metals will be attenuated by natural geologic materials.

A permanent water treatment plant will handle flows from Impoundment No.1 pumpback water, the impoundment No. 2 underdrain, pit inflow water, and any water from the waste dump capture systems. Treated water would be discharged to groundwater through an infiltration basin that would be located south of impoundment No. 1.

B. SIGNIFICANCE DETERMINATION

1. *(High quality waters)* Golden Sunlight, Inc. proposes to discharge wastewater from waste rock dumps, impoundments, and the water treatment plant to groundwater. Class I groundwater, under Montana Ground Water Standards, is considered high quality waters. Much of the groundwater on the east side of the mine area in the Bozeman group sediments and in the Jefferson River alluvium is designated as Class I (GSM, 1998). Class I groundwaters are suitable for public and private water supplies, culinary and food processing purposes, irrigation, livestock and wildlife watering, and for commercial and industrial purposes with little or no treatment and have a specific conductance of less than 1000 micromhos/cm at 25 degrees C [ARM 17.30.1002(2)(a)].

Groundwater in the bedrock aquifer on the west side and some of the groundwater in the Jefferson River alluvium in the southeast corner of the of the mine area is designated as Class II groundwaters which are considered high quality waters (GSM, 1998). This water is generally marginally suitable for public and private water supplies, culinary and food processing uses, are suitable for irrigation of some agricultural crops, for drinking water for most wildlife and livestock, and for most commercial and industrial purposes and have a specific conductance ranging from 1000 to 2500 micromhos/cm at 25 degrees C. Class II groundwater may be used for municipal or domestic water supplies in areas where better water is not available [ARM 17.30.1002(2)(b)].

Class III groundwater exists in isolated areas below impoundment No. 1, in the Jefferson River alluvium southeast of the mine site, and around the pit area (GSM, 1998). Class III groundwater is not considered high quality waters but is suitable for some industrial and commercial uses and as drinking water for some wildlife and livestock and for irrigation of some salt tolerant crops using special water management practices. In some cases these groundwaters are the only

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economically feasible source for municipal and domestic water supplies. Class III groundwaters have specific conductivities ranging from 2500 to 15,000 micromhos/cm at 25 degrees C [ARM 17.30.1002(2)(c)].

2. *(Downstream effects)* Impacts to the Jefferson River have been addressed in the EIS. The analysis concludes that the river would not be impacted from mine discharges because of its distance from the facility and the lack of a direct hydrologic connection between discharging groundwater and surface water.

3. *(New or increased source)* This significance determination is made pursuant to the current nondegradation rules adopted in 1994. All discharges resulting from approval of Amendment 8 described in the GSM, 1990 Environmental Analysis are also considered to be subject to the most recent nondegradation rule requirements because of the Montana District Court ruling that Montana Department of State Lands improperly evaluated the potential for significant environmental impacts from implementation of Amendment 8 and that an EIS must be prepared to further evaluate these impacts. Under present nondegradation rules, discharges from the water treatment plant, the waste dumps proposed in Amendment 8 as well as the expanded dumps proposed in DEQ and BLM (1998) are considered new sources [ARM 17.30.705]. Discharges from all other facilities including tailing impoundment No. 1 and preexisting waste dumps are not considered new or increased sources since they were in existence prior to 1990. Because discharges from pre-1990 facilities cannot be easily separated from those of post-1990 facilities, all discharges will meet the stricter nondegradation limits at the mixing zone boundary.

4. *(Categorically Excluded)* This mixing zone determination applies to activities described in the GSM application and permitted under operating permit #00065 which are subject to Montana's Nondegradation Policy. It does not apply to exploration activities which are exempt from nondegradation review.

5. *(Mixing Zone)* GSM has demonstrated that the criteria of 75-5-301(4), MCA and ARM 17.30.501 et seq. governing the granting of mixing zones are satisfied (GSM, 1998). The mixing zone will be authorized through the DEQ, Hard Rock Mining Program and GSM's Operating Permit #00065.

The applicant proposes discharges to groundwater through infiltration basins, waste dump seepage, and seepage from impoundment No. 1. Waste dump and impoundment No. 1 seepage will not meet applicable groundwater standards, therefore, a mixing zone is required for discharges from these facilities. At this time a mixing zone is not required for the water treatment plant effluent because the effluent is predicted to meet all ground water standards and nondegradation limits. However, this mixing zone analysis authorizes GSM to discharge effluent containing constituents above standards if needed provided that GSM first submit a monitoring plan and demonstrate that nondegradation criteria at the site-wide mixing zone boundary will not be violated.

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6. *(Increase in Carcinogens or BCF)* The only constituent with a bioconcentration factor (BCF) greater than 300 is mercury which is not expected to be present in any of the discharges. The only carcinogen occurring in the discharges is arsenic. Discharges containing arsenic are considered nonsignificant if concentrations in the discharge are less than or equal to the concentrations of these parameters in the receiving waters. This only applies to new or increased discharges subject to nondegradation requirements such as the water treatment plant infiltration basin and the post-1990 waste dumps on the east and west sides. Impoundment No. 1 and the pre-1990 waste dumps are exempt from nondegradation requirements and therefore an increase in arsenic within the mixing zone is allowed for these facilities.

7. *(Increase in toxics and nutrients)* Several constituents classified as toxic in DEQ Circular WQB-7 (DEQ, 1995), as well as nutrients, are expected it be present in the mine discharges. Toxic constituents include cyanide, copper, chromium, cadmium, nickel, lead, selenium, and zinc. The estimated concentration of these constituents is based on monitoring conducted by GSM (GSM, 1998).

In order to determine if these changes will cause degradation, the effluent concentration is analyzed to determine if the trigger value is exceeded. Whenever the change exceeds the trigger value, the change is not significant if the resulting concentration does not exceed 15% of the applicable (human health) standard. This analysis employs standard mixing calculations. A discharge is also considered nonsignificant if concentrations in the receiving waters are higher than in the discharge [MCA 75-5-306].

Several parameters exceed the respective trigger levels in each of these analyses, however, the resulting change does not exceed 15% of the applicable standard or the ambient quality of the receiving water. Degradation, outside of the mixing zone, due to toxic constituents is not predicted based on the projected concentrations in the discharge.

8. *(Harmful Parameters)* Montana Nondegradation rules consider increases in harmful constituents of less than 10% to be nonsignificant if existing water quality is less than 40% of the standard [ARM 17.30.715(1)(f)]. The proposed discharge may have several harmful constituents, including iron, manganese, and hydrogen ion (pH). Based on the results of the mixing analysis, the calculated increase in iron and manganese is considered nonsignificant.

There are no ground water standards for pH. The primary concern for pH change in ground water is an increase in metals due to lower pH. If the pH of the groundwater is maintained above 6.0 s.u., metal mobility is not expected to be effected. The estimated pH of the seepage from the waste dumps and impoundment No. 1 is 2.4 s.u. based on data from GSM (GSM, 1998). After chemical neutralization in the subsurface, the resulting pH at the mixing zone boundary is not less than ambient groundwater pH at the mixing zone boundary and, therefore, does not constitute degradation.

9. *(Narrative Parameters)* Discharges from GSM must not exceed levels that would render groundwater harmful to public health outside of a designated mixing zone, and the discharge must

not exceed concentrations that would adversely affect existing beneficial uses or the designated beneficial uses of groundwater of that classification outside of a designated mixing zone [ARM 17.30.1003(3)]. Groundwater in the vicinity of the mixing zone boundary, where mine waters would ultimately discharge, is classified as Class II with isolated areas of Class III (GSM, 1998). Sulfate is a major constituent in all of the discharges and is predicted to be as high as 30,000 mg/L in the dump seepage. The specific conductance and sulfate concentration at the mixing zone boundary must stay within the ranges defined by ambient conditions, and groundwater classification criteria and associated beneficial uses. In all cases, ambient sulfate concentrations at the mixing zone boundary would not change.

10. *(Nitrogen in Ground Water)* The predicted concentration of nitrate in the effluent discharged to groundwater ranges from 0.11 to 5.74 mg/L. These concentrations are below the significance threshold of 7.5 mg/L for non-domestic wastes established by ARM 17.30.715, and therefore, would not cause significant degradation.

11. *(Additional Criteria - ARM 17.30.715(2))* There are no additional factors, in the departments analysis of this project that would require a finding of significant degradation.

C. MIXING ZONE DESIGNATION

The mixing zone boundary for GSM as designated by the Department encompasses a portion of GSM's property downgradient of mine facilities as shown on Figure 1. The mixing zone extends to the BLM property boundary on the west, to the GSM property boundary to the south of Bull Mountain, and east to the eastern edge of the permit boundary. The southern portion of the mixing zone within the Jefferson River alluvium encompasses the flow path from the historic release from impoundment No. 1.

Discharges to groundwater are predicted for several different mine facilities including the waste rock dumps, tailings impoundment No. 1, and the water treatment plant effluent infiltration pond. In some locations the contaminants migrating from one facility would merge with contaminants migrating from other facilities. For example, contaminants from the east side waste rock dumps and east flank of the west side waste rock dumps are expected to migrate under and merge with the contaminants from the tailings impoundment No. 1 and water treatment plant effluent infiltration basin. For this reason, one all encompassing mixing zone has been designated for the mine instead of several smaller overlapping mixing zones designated for each facility.

Evaluation of Discharges From the East Side Waste Rock Dumps

The east side waste rock dumps are located over Bozeman Group sedimentary material. These sedimentary units are composed of layers of sand, silt, and clay deposited in a fluvial environment. The overall bulk permeability ranges from 10^{-5} to 10^{-4} cm/sec, however, the thin sand layers can have a much greater permeability. These sediments are generally calcareous and have the capacity to neutralize acidic drainage. Groundwater in the Bozeman unit flows in a southerly direction and ultimately discharges into the Jefferson River alluvial aquifer. Modeling of contaminant migration in the Bozeman unit aquifer from the east side dumps is presented in FEIS (DEQ and BLM, 1998, App. J). The model predicts approximately 10 to 21 gpm of seepage and that full chemical neutralization of acidic seepage from the east waste rock dumps would occur at a distance of between 2,200 and 4,400 feet from the toe of the dumps. This is close to the Bozeman Unit/Jefferson River alluvium contact south and southeast of impoundment No. 2. At the mixing zone boundary the seepage from the dump would be similar to ambient groundwater quality. Based on results from column attenuation tests, acid rock drainage (ARD) would be neutralized to a pH of approximately 7. Metals mobility and dissolved metals concentrations would be greatly reduced and sulfate concentrations would be in an acceptable range (800 to 1300 mg/L) for Class II groundwaters and would also be similar to ambient quality at the mixing zone boundary.

Evaluation of Discharges From the West Side Waste Rock Dumps

The west side is composed of fractured bedrock that includes siltstone, mudstone, sandstone and shale lithologies. The overall bulk permeability ranges from 10^{-4} to 10^{-7} cm/sec however, individual fractures can have a much greater permeability. These rocks contain groundwater of lower quality than in the Bozeman unit and do not have the ability to neutralize acidic drainage. Groundwater in the bedrock unit west of the mine flows toward the southwest and groundwater in the bedrock to the south of the pit area flows toward the south. Acid rock drainage migration through the bedrock aquifer on the west side was modeled differently than ARD migration through the Bozeman unit aquifer on the east side. This is because, on the west side, groundwater flows in a fractured system with very little acid neutralization capacity while on the east side groundwater flows through the Bozeman unit which contains calcareous sediments with a high acid neutralization capacity. Reduction in concentrations within the west side bedrock aquifer is assumed to be dependent on dilution alone. Based on field evidence and predictive modeling, the quantity of seepage from the west dumps is estimated to range from 7 to 14 gpm.

Assuming a 50% capture efficiency for the toe drains and an 82% capture efficiency for pumpback wells on the west flank of the west dump, water quality requirements would be met at the mixing zone boundary (Table 1). Implementation of mitigation measure W-10 (DEQ and BLM, 1998), which specifies a hydrogeologic investigation on the west side, will be necessary to ensure that required efficiencies are achieved for the west side capture systems.

For the east flank of the west dump, mixing zone calculations indicate that the dump seepage quality will not be significantly different from ambient conditions and therefore will have little effect on downgradient water quality (Table 2).

Evaluation of Discharges From the Water Treatment Plant

The infiltration pond that will be used for disposal of treated water from the treatment plant would be located to the south of impoundment No. 1 either on Bozeman Group sediments or on Jefferson River alluvium. The alluvium, located along the southern boundary of the mixing zone, is composed of highly permeable sand and gravel. Groundwater in the alluvium flows in an easterly direction parallel to interstate 90. The plant will be designed to treat and subsequently discharge 450 gpm of mine water. The quality of the discharge water is shown in Table 3. A mixing zone is not required for this discharge because none of the constituents present in the effluent exceeds the nondegradation limits or ambient groundwater quality.

Evaluation of Discharges From Tailings Impoundment No. 1

GSM is required to reclaim the impoundment to minimize rainfall infiltration. After reclamation and dewatering of the tailings (7-10 years) the long-term seepage rate from the impoundment is estimated to equal approximately 2 gpm. The tailings contain sulfide minerals which after dewatering will produce ARD. The long-term quality of the seepage from the impoundment will be close to the quality of the mine pit water (Table 4). Because the impoundment no longer receives cyanide-bearing solutions from the mill, and the natural degradation of cyanide, the concentration of cyanide in the impoundment has dropped to about 30 mg/L and is expected to continue to decrease. When the tailings become acidic, cyanide will degrade to very low levels. Nitrate concentrations may initially rise due to degradation of cyanide and conversion of ammonia to nitrate, before decreasing to background concentrations. A mixing zone is required for this discharge because the predicted long-term seepage from the impoundment is expected to exceed water quality standards for several constituents. Because of the complexities of metal geochemistry and the difficulty of predicting the migration and attenuation of metals in the subsurface, the mixing zone analysis simply specifies the concentrations of pollutants that GSM will be *required* to maintain at the mixing zone boundary. The ambient water quality, Montana water quality standards and nondegradation limits at the mixing zone boundary are shown in Table 4. At present, water quality trends show close to 100% reduction in constituent concentrations between the impoundment and the mixing zone boundary (GSM, 1998, Attachment 3) indicating that the concentrations specified in Table 4 are achievable.

D. WATER QUALITY ASSESSMENT

The following discussion describes the factors considered by the Department in making its decision as specified in ARM 17.30.506:

a. *Biologically important areas*: The Jefferson River is the only surface water body in the area that supports a fishery. Because the infiltrated water would not discharge to the river, and concentrations would not exceed nondegradation limits at the end of the mixing zone, no impact to aquatic life is expected.

b. *Drinking water or recreational activities*: This mixing zone analysis demonstrates that beneficial uses would not be impaired for downstream groundwater or surface water users. There are no domestic wells within the designated mixing zone. The mixing zone would have a minimum practicable effect on water users because the nearest domestic well is beyond the point where the concentrations of constituents are diluted to below human health standards.

c. *Toxicity/persistence of the substance discharged*: The toxicity of constituents analyzed in this document are reflected in the standards defined in DEQ (1995) and nondegradation criteria. The length of time that the waste dumps and tailings are predicted to produce ARD seepage is between 2,000 and 12,000 years. The treatment plant is proposed to be operated in perpetuity. The persistence of metals in the groundwater system is dependent on dilution, adsorption, and chemical precipitation mechanisms. Metals in general do not migrate very far in the calcareous sediments present on the east side and any metal ions that migrate into the subsurface are expected to attenuate within a very short distance. Metals concentrations in the groundwater system on the west side are reduced mainly through dilution and increasing pH.

d. *Cumulative effects of multiple mixing zones*: The Department has not designated any other mixing zones in the area.

e. *Aquifer characteristics*: Aquifer characteristics are reasonably well understood for the Bozeman unit, and the Jefferson Alluvium. Monitoring of water levels and water quality over the life of the mine has generated a large hydrologic data base and a general understanding of the fate and transport of metals and other constituents in the local groundwater systems. Mitigation measure W-10 (DEQ and BLM, 1998) requires GSM to conduct a hydrogeologic investigation of the bedrock aquifer on the west side to further delineate groundwater flow paths in an effort to optimize monitoring well locations and capture system design.

f. *Groundwater discharges to surface water*: Groundwater that migrates away from the mine site does not discharge directly into any surface water body but instead discharges into the Jefferson River alluvial aquifer where further dilution takes place.

E. WATER QUALITY STANDARDS

The mixing zone dimensions are based upon compliance with Montana Numeric Water Quality Standards (Circular WQB-7), Montana's nondegradation policy (ARM 17.30.701 et seq), Montana's Mixing Zone Rules (ARM 17.30.501 et seq), and Montana's Groundwater Regulations (ARM 17.30.1001 et seq).

F. SELF MONITORING REQUIREMENTS

Whenever the department determines that a proposed activity will not result in degradation, the department may require monitoring to verify compliance with Montana's Nondegradation Policy (75-5-303, MCA) and standards. The mixing zone application (GSM, 1998) and the Long Term Water Management Plan (DEQ and BLM, 1998, App. A) include a compliance monitoring and mitigation plan designed to provide early detection of any emerging water quality changes.

provide information necessary to evaluate compliance with applicable water quality regulations, and implement mitigation measures should water quality degradation occur.

The following monitoring was identified and stipulated in the FEIS:

- water quality monitoring of springs and seeps.
- groundwater monitoring at the mixing zone boundary.
- groundwater monitoring immediately downgradient of sources to ensure that the groundwater concentrations at the designated mixing zone boundary do not exceed applicable standards.

This determination is not effective until monitoring plans have been approved by the Department and incorporated into the operating permit.

G. CONTINGENCY PLAN

If monitoring indicates that water quality compliance limits would be exceeded at the mixing zone boundary, a contingency plan would be implemented. The contingency plan is described in Appendix B, Section 7.0 of the FEIS.

H. LITERATURE CITED

DEQ, 1995. Montana Numeric Water Quality Standards, Circular WQB-7.

DEQ and BLM, 1998. Final Environmental Impact Statement Amending and Adopting the Draft Environmental Impact Statement, Golden Sunlight Mine.

GSM, 1998. Water Quality Regulatory Compliance and Application for Source Specific Groundwater Mixing Zone, Golden Sunlight Mines, Inc., January.

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Table 1. Evaluation of Predicted Groundwater Concentrations from the West Side Waste Rock Dump -- West Flank.

Parameter	Assumed Groundwater Quality		Predicted Groundwater Quality*				
	Ambient GW Concentration[1] (mg/L)	Dump Seepage Concentration[2] (mg/L)	Pumpback Wells[3] (mg/L)	Calculated Concentration at Mixing Zone Boundary[4] (mg/L)	Estimated Ambient GW Concentration at Mixing Zone Boundary[5] (mg/L)	Montana Groundwater Quality Standards[6] (mg/L)	Montana Nonsignificance Limits[6] (mg/L)
sulfate	1011	20000	3046	429	319	narrative	none
arsenic	0.007	0.027	0.009	0.0015	0.0006	0.018	no increase
cadmium	0.002	0.014	0.003	0.0005	0.0010	0.005	0.0008
copper	0.01	9.18	0.24	0.146	0.033	1	0.15
chromium	0.034	0.225	0.024	0.0042	0.0021	0.1	0.015
iron	2.34	33.3	7.8	1.20	1.20	0.3	NA***
lead	0.007	0.003	0.007	0.0011	0.0006	0.015	0.002
manganese	1.85	6.620	2.284	0.294	0.049	0.05	NA
nickel	0.132	1.077	0.236	0.041	0.070	0.1	NA
selenium	0.002	0.002	0.002	0.0004	0.0010	0.05	0.0075
zinc	0.450	2.690	0.662	0.114	0.233	5	0.75
NO3+NO2	0.169	0.11	0.164	0.020	0.027	10	7.5
pH**	3.8	2.4	3.49	3.60	3.73	narrative	none

NOTES: * Data shown assumes 30 gpm ambient groundwater flow beneath waste rock dump, 50% toe drain capture efficiency, 85% pumpback well capture efficiency.
** Mixing predictions assume pH of precipitation is 5.7; pH derived from simple mixing only probably biased low
***NA = not applicable. Nondegradation does not apply if ambient concentrations already exceed standards.

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[1] Calculated from Historic data for wells PW-2, -13,-14,-15,-16,-21,-42,-45, and Adams Spring ([illegible], 1993, Attachment 1)

[2] Calculated from waste rock dump lysimeter data ([illegible], 1994, Table 2-1)

[3] Calculated from mixing ambient groundwater flow upgradient of pumpback wells with net dump seepage after toe drain capture.

[4] Calculated from mixing net flow downgradient of pumpback wells with precipitation recharge over the mixing zone area.

[5] Calculated from mixing ambient groundwater (no dump seepage) with precipitation recharge.

[6] From Montana Circular WQB-7, and Nondegradation Rules.

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Table 2. Evaluation of Predicted Groundwater Concentrations from the West Side Waste Rock Dump – East Flank.

Parameter	Assumed Groundwater Quality		Predicted Groundwater Quality*				
	Ambient GW Concentration¹ (mg/L)	Dump Seepage Concentration² (mg/L)	Pumpback Wells³ (mg/L)	Calculated Concentration at Mixing Zone Boundary⁴ (mg/L)	Estimated Ambient GW Concentration at Mixing Zone Boundary⁵ (mg/L)	Montana Groundwater Quality Standard⁶ (mg/L)	Montana Nondegradation Limit⁶ (mg/L)
sulfate	3730	30000	4062	644	1540	narrative	none
arsenic	0.0060	0.027	0.008	0.0040	0.0022	0.018	no change
cadmium	0.027	0.014	0.024	0.0031	0.010	0.005	NA***
copper	0.106	9.18	0.34	0.070	0.044	1	0.15
chromium	0.080	0.225	0.018	0.0024	0.0055	0.1	0.015
iron	148	33.3	143.5	10.62	61.4	0.3	NA
lead	0.022	0.005	0.021	0.0027	0.0091	0.015	NA
manganese	13.8	4.620	13.459	1.746	3.73	0.05	NA
nickel	2.46	1.077	2.394	0.311	1.02	0.1	NA
selenium	0.0032	0.002	0.003	0.0004	0.0013	0.05	0.0075
zinc	0.99	2.690	0.690	1.13	3.73	5	NA
NO2+NO3	0.050	0.11	0.089	0.013	0.041	10	7.5
pH**	3.7	2.4	3.64	3.43	4.9	narrative	none

NOTES: * Data shown assumes 40 gpm ambient groundwater flow beneath waste rock dump, 50% toe drain capture efficiency, 80% pumpback well capture efficiency.
** Mixing predictions assume pH of precipitation is 5.7; pH derived from simple mixing only probably biased low.
***NA = not applicable. Nondegradation does not apply if ambient concentrations already exceed standards.

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[1] Calculated from historic data for wells PW-3, -17, and Hoppes Spring (CBM, 1998, Attachment 1)

[2] Calculated from waste rock dump lysimeter data (CBM, 1998, Table 2-1)

[3] Calculated from mixing ambient groundwater flow upgradient of pumpback wells with net dump seepage after toe drain capture.

[4] Calculated from mixing net flow downgradient of pumpback wells with precipitation recharge over the mixing zone area.

[5] Calculated from mixing ambient groundwater (no dump seepage) with precipitation recharge.

[6] From Montana Circular WQB-7, and Nondegradation Rules.

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Table 3. Evaluation of Predicted Groundwater Concentrations from the Water Treatment Plant Effluent discharge.

Parameter	Assumed Groundwater Quality		Standards	
	Ambient GW Concentration at Mixing Zone Boundary[1] (mg/L)	Effluent Concentration[2] (mg/L)	Montana Groundwater Quality Standards[3] (mg/L)	Montana Nonsignificance Limits[3] (mg/L)
sulfate	1308	1580	narrative	none
arsenic	0.006	<0.005	0.018	no change
cadmium	0.0001	0.0001	0.005	0.0008
copper	0.015	0.076	1	0.15
chromium	0.001	<0.001	0.1	0.015
iron	0.078	0.01	0.3	0.03
lead	<0.01	0.001	0.015	0.002
manganese	0.047	0.005	0.05	0.05
nickel	0.013	0.008	0.1	0.015
selenium	0.0075	<0.001	0.05	0.0075
zinc	0.08	0.04	5	0.75
NO2+NO3	61	5.74	10	NA
pH	6.9	7	narrative	none

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[1] From OSM 1998, Table 4-4 and Attachment 1H

[2] From OSM, 1998, Table 4-4, plus results from the November and December 1997 treatment tests

[3] From Montana Circular WQB-7 and Nondegradation Rules

Table 4. Evaluation of Predicted Groundwater Concentrations from Impoundment No. 1.

Parameter	Assumed Groundwater Quality		Predicted Groundwater Quality		
	Ambient GW Concentration at Mixing Zone Boundary[1] (mg/L)	Impoundment Seepage Concentration[2] (mg/L)	Required Concentration Reduction from Pumpback Wells, Dilution, and Retardation[3] (%)	Montana Groundwater Quality Standards[4] (mg/L)	Montana Nonsignificance Limits[4] (mg/L)
sulfate	1308	10240	87.2	narrative	none
arsenic	0.006	0.411	98.5	0.018	no change
cadmium	0.0001	0.641	99.9	0.005	0.0008
copper	0.015	75.9	99.8	1	0.15
chromium	0.001	0.009	0	0.1	0.015
cyanide	<0.005	30	99.9	0.20	0.03
iron	0.078	1170	99.9	0.3	0.03
lead	<0.01	0.274	99.3	0.015	0.002
manganese	0.047	126	99.9	0.05	0.05
nickel	0.013	5.84	99.7	0.1	0.015
selenium	0.0075	0.035	78.6	0.05	0.0075
zinc	0.08	90.4	99.2	5	0.75
NO2+NO3	61	10.9	31.2	10	NA
pH	6.9	2.7	60.9	narrative	none

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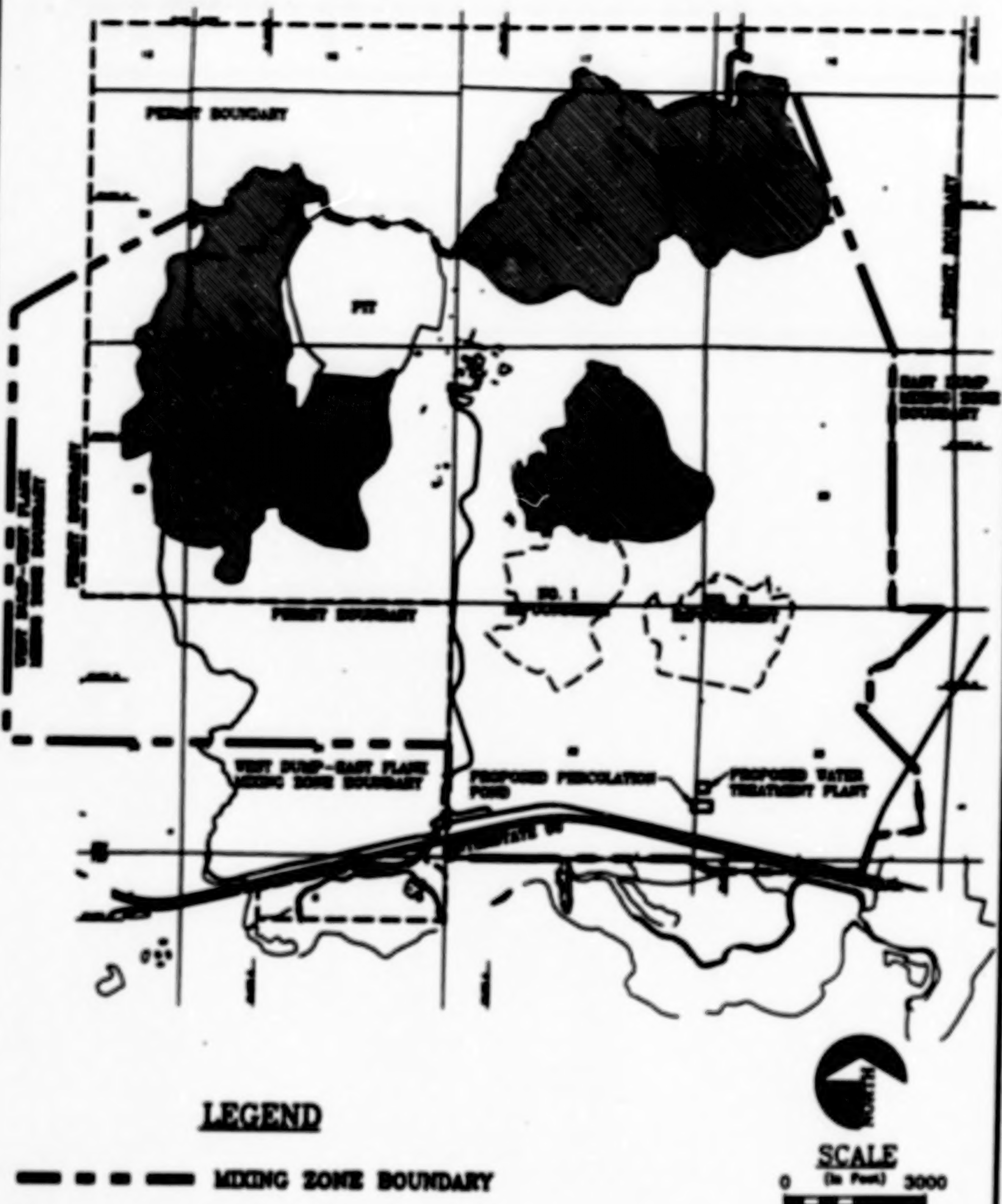
[1] From GBM, 1998, Table 4-4 and Attachment 1H

[2] Long-term seepage quality estimated as equivalent to mine pit water quality (GBM, 1998, table 3-3)

[3] Required reduction in concentration from pumpback wells, natural attenuation, and dilution to meet nondegradation limits at mixing zone boundary given the above estimated seepage concentrations. If actual seepage concentrations are different, then reduction percentages would also be different.

[4] From Montana Circular WQB-7, and Nondegradation Rules


PERMIT BOUNDARY
PIT
PERMIT BOUNDARY
EAST DUMP MIXING ZONE BOUNDARY
WEST DUMP-WEST FLANK MIXING ZONE BOUNDARY
PERMIT BOUNDARY
NO. 1 IMPOUNDMENT
IMPOUNDMENT
PERMIT BOUNDARY
WEST DUMP-EAST FLANK MIXING ZONE BOUNDARY
PROPOSED PERCOLATION POND
PROPOSED WATER TREATMENT PLANT
INTERSTATE 90
LEGEND
MIXING ZONE BOUNDARY
NORTH
SCALE
0
(In Feet)
3000

GOLDEN SUNLIGHT MINES, INC.
APPLICATION FOR SOURCE SPECIFIC
GROUNDWATER MIXING ZONE

MIXING ZONE

FIGURE
1

Hydrometrics, Inc.

END

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